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JUNE 1998 ISSUE 106

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See page 60

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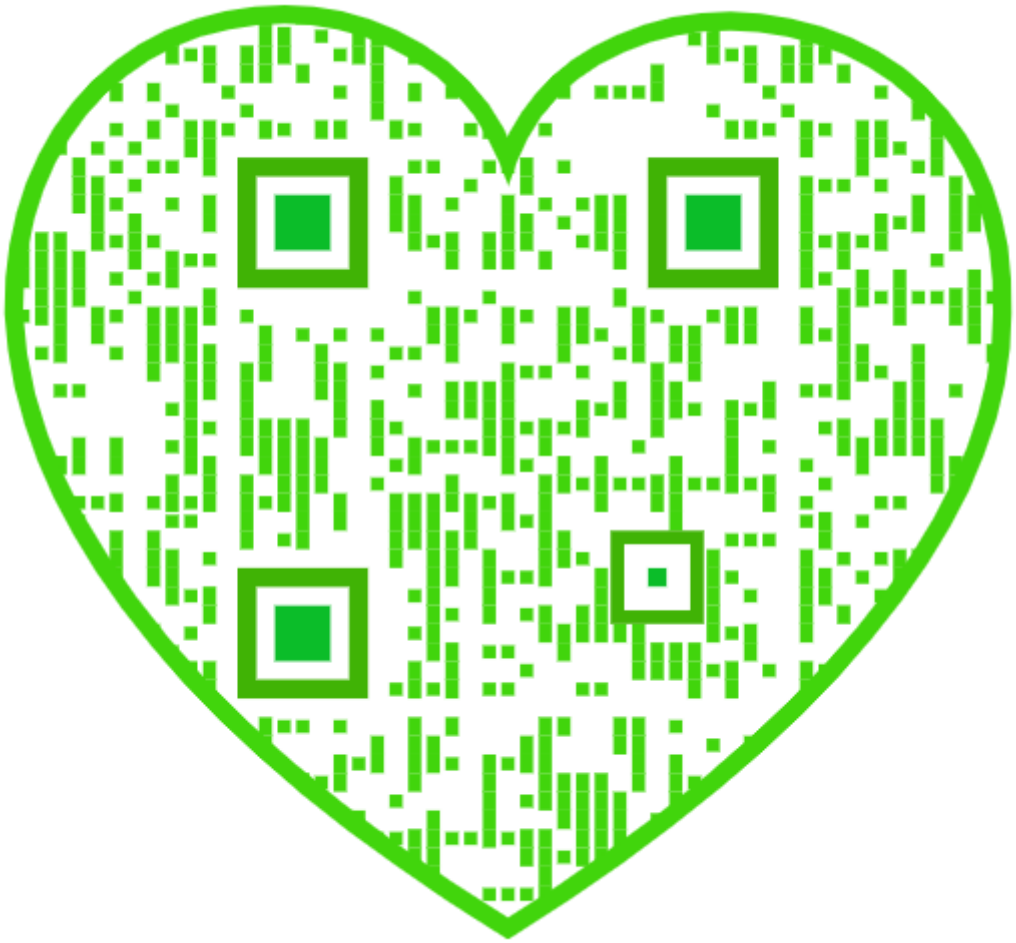

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ISSUE NO. 106 JUNE 1998
This issue's cover wood grain: sycamore

Better Homes and Gardens®
WOOD®
THE WORLD'S LEADING WOODWORKING MAGAZINE

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THE WORLD'S LEADING WOODWORKING MAGAZINE

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THE EDITOR'S ANGLE

Welcome to WOOD SHOW ONLINE™

The World's First Virtual Woodworking Show

If you've ever been to a woodworking show, you know how stimulating attending one can be. All the informative woodworking seminars, the product vendors, the show specials on tools and products, the excitement of talking with other woodworkers about your favorite hobby—it's great! The only problem is that many woodworkers have to travel long distances to take part in the fun. No longer!

We've decided it's high time that someone bring a woodworking show into the homes of millions via the internet. The same group of *WOOD* magazine staffers who built our *WOOD* ONLINE® site on the internet (www.woodmagazine.com) have come up with a zinger of an idea that I hope many of you will take advantage of. We call our new baby *WOOD* SHOW ONLINE, and as far as we know it is the first virtual woodworking show ever created.

A few years ago, *WOOD* SHOW ONLINE would have been little more than a gleam in someone's eye. But now it's very real. Our inaugural show will start sometime in May, but you can register today. Just contact us at www.woodmagazine.com.

We're hosting *WOOD* SHOW ONLINE because we believe it will allow many more people to share in the excitement that woodworking shows offer. Remember, all of this is free! If you don't have a computer yet, or you haven't mastered the one you do have, perhaps this will be the motivation you need to get started. It'll be lots of fun—I guarantee it.

Larry Clayton

Here are just some of the exciting things we plan to build into our show

- Exhibitor booths you can visit by just clicking a button.
- Free woodworking seminars on these topics:
  Wood finishing & refinishing, Scrollsaw techniques, Joinery, Turning, and more
- An interactive discussion group for show attendees.
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- Direct links to exhibitor sites.
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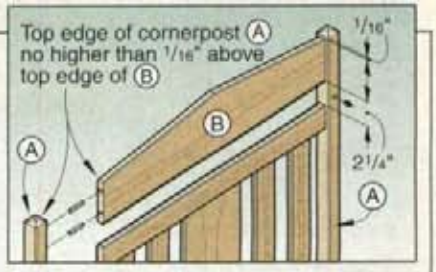
TALKING BACK

Crib safety warning

Regarding the article "Tag Team Woodworking" in issue #101, please pass this word on to those particular gentlemen and all of your readers. Don't ever extend the corner posts of a crib or playpen above the endrails. Cut the endrails flush and in a downward slope toward the outside. The problem with corner posts is that a baby, trying to climb out of a crib, could catch its shirt on the post and hang him or herself. It is our job as builders to make certain our products are safe.

—Daniel Blackmore, via internet



Dan, we ran the correction shown above in issue #61 when we learned that the Juvenile Products Manufacturers' Association follows a standard that allows corner posts of baby cribs to have no more than a 1/16" projection above the top rail. The U.S. Consumer Products Safety Commission supports this standard. We appreciate readers like you, Dan, for helping us keep a close eye on these important safety issues.

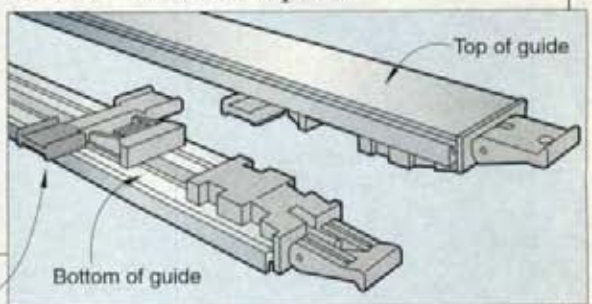
A tip for a tip

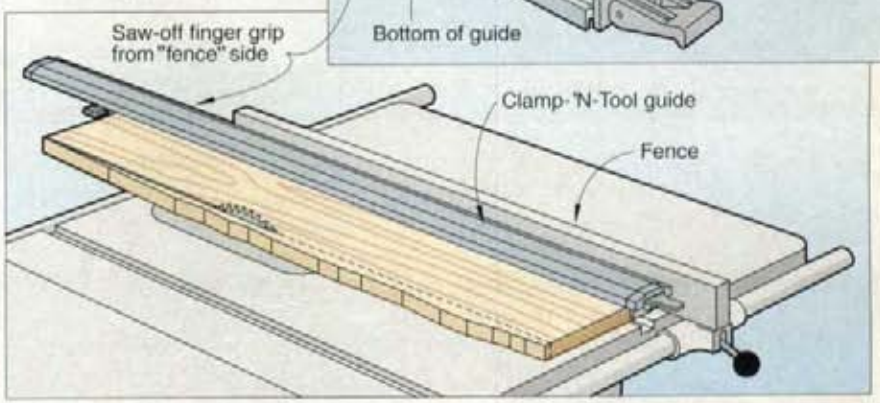
It would appear that Glenn Sperry left out one small detail in his letter published in issue #99, "Tips from your shop (and ours)". The tip was to edge-straighten boards with his "Clamp 'N Tool Guide".

The finger grips on the adjustable jaw of this tool stick out about ⅜" past the edge that would ride against the tablesaw fence. Mr. Sperry must have removed this protrusion on one side of the "Clamp 'N Tool Guide" for his method to work.

—Harry McNeil, Toronto

You're right, Harry. You must remove part of the finger grips to make this guide work for edge-straightening. However, don't remove too much—you will ruin the locking mechanism that holds the guide firmly to the workpiece.





Let us know what's on your mind

We welcome your comments, criticisms, suggestions, and yes, even compliments. We'll do our level best to respond to you, perhaps on this page!

Write to us at: Talking Back, *WOOD* Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379. Send e-mail to: woodmail@woodmagazine.com

Continued on page 6

HOT BLADE.

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What is it?

Our new line of Teflon® coated blades. TCS, short for a new industrial coating by DuPont® that makes our blades run super fast, super smooth and super cool.

How?

• The coating makes these blades more resistant to friction and heat buildup. The blade stays up to 50% cooler than non-coated blades. This helps the wood glide by the blade with a lot less effort compared to conventional blades. So, you get some major benefits.

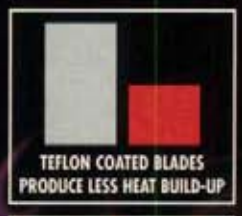
• This puts less stress on the blade. Studies by DuPont tell us that TCS coated blades last up to 50% longer than conventional blades before sharpening.

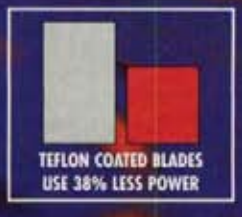
• It also causes less pull on the saw, 38% to be exact. Which translates into over 1/3 more cutting power. And as a bonus, the smoother cutting action means less wear and tear on the motor.

• TCS blades won't bind like conventional blades. The self-lubricating, non-stick finish sheds sappy wood residue before it builds up. So you will get a smoother, more professional cut with TCS blades.

• Clean up with these blades is also easy. Pitch and resins just don't stick well to the industrial Teflon. So, even after extensive use, simply wipe clean with hot water.

• Don't be concerned about cleaning the blades with water. The Teflon coating makes the blade rust resistant, in fact, you don't need oils, greases or rust-preventatives.





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Continued from page 4

Wanted: The designer of this project

In our IDEA SHOP 3® we show the swing down lumber rack *left*. Now, we're looking for the faithful reader who first submitted this plan to us so that we can run it in an upcoming issue. Please contact us ASAP.

Thanks for a great jig

I keep finding new ways to use the Universal Tablesaw Jig in the December 1996 issue. I use it for all my cross-cutting and for cutting tapers, ripping smaller pieces, and making picture frames. The hold-down feature works superbly. I have now been using this jig almost daily for five months, and I have yet to find a fault or weakness. All my kudos to Jim Downing and the crew at *WOOD*® magazine.

—Bill Allen, Brunswick, Ga.

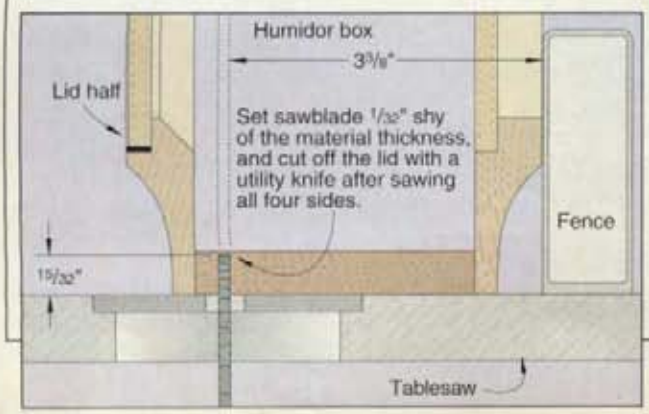
We're glad you find this jig as useful as we do, Bill. Readers can still get the kit through the company store on our internet home page, or by contacting:

Schlabaugh & Sons Woodworking
720 14th Street
Kalona, IA 52247
800/346-9663

Leave a little on the lid

I have a technique for cutting a lid from a box that's useful for the Grand Humidor project in the August 1997 issue. Instead of using spacers to keep the space even while making all four cuts, I set the blade 1/32" shy of the material thickness. This leaves a thin layer that holds the spacing even while making the last cut. Then, I finish cutting the lid from the box with a sharp utility knife. The thin lip sands down easily, and this technique makes cutting the lid from the box a little easier.

—Charles Smith, Townsend, Mass.


Humidor box
3 3/8"
Lid half
Set sawblade 1/32" shy of the material thickness, and cut off the lid with a utility knife after sawing all four sides.
Fence
19/32"
Tablesaw

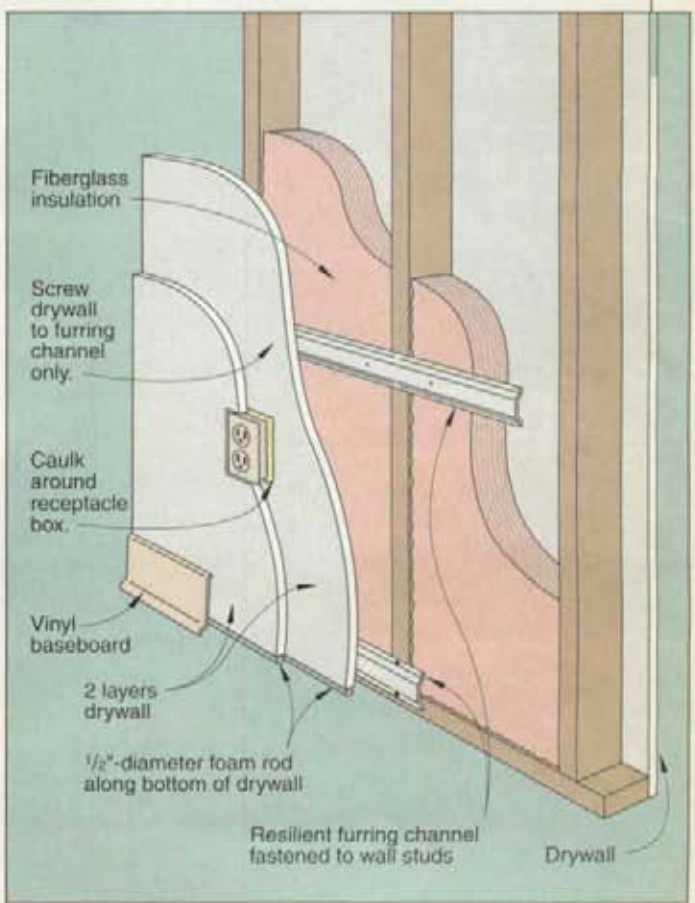
Supress shop sounds

I loved the basement shop setup in the November 1997 issue. When I built my basement shop, I took some extra steps by soundproofing the walls and ceiling. To do this, I built 2×4 stud walls for all four sides. I then insulated the walls and ceiling and installed sound channel between the frame and the drywall. While the shop isn't totally soundproof, our four-year-old can sleep on the sofa just outside the shop, even when I run the planer.

—Jim Bartholomew, Logan, Ohio

Soundproofing the shop seems like a good way to promote harmony in the house, Jim. By the way, another name for sound channel is resilient channel. It comes in 12' lengths, and you can usually find it at an acoustical or drywall supplier. It works because a stud's density makes it an excellent transmitter of sound. The channel allows the drywall to stand away from the stud as shown right, *creating a sound barrier. Essentially, it becomes a secondary frame on which to screw the drywall.*

If you can't find resilient channel, you can build a staggered 2×4 wall, weaving a 1/8" thick sound bat between the inner and outer studs. However, this option costs more, and takes more space.


Fiberglass insulation
Screw drywall to furring channel only.
Caulk around receptacle box.
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2 layers drywall
1/2"-diameter foam rod along bottom of drywall
Resilient furring channel fastened to wall studs
Drywall

TOOL TALES

[REAL STORIES OF *LEATHERMAN® TOOLS* AND THE PEOPLE WHO USE THEM.]

No. 6

We had two choices: crash in Dillingham or head back to Anchorage and crash there.

As we descended from 12,000 feet the landing gear got stuck. The backup system failed. The fuel level was getting low. And the ALASKA Range loomed ahead.

So, while my co-pilot flew, I got out my LEATHERMAN Tool. I was upside down as I pried open the instrument panel with the screwdriver. Then, using the needle nose pliers, I fished out a broken cable. I kept pulling and with a CLUNK, CLUNK, CLUNK, the landing gear descended and locked.

We landed safely in Dillingham. I gave my Leatherman Tool the next day off.

Mike Harden
Dillingham,
ALASKA.

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10 Painless ways to what you make

Want to make money with your woodworking? Try these time-tested strategies used by the pros.

Nobody goes into woodworking because they like marketing. But once you start selling your work, you're automatically involved in it. And everyone in business for themselves finds ways to get their marketing done as painlessly as possible. Here are 10 that have a proven track record.

1 Get business cards. This is one of the cheapest and most effective marketing tools. Yet it's amazing how many woodworkers show their items at craft shows without displaying business cards.

2 Use word of mouth. The quality of your work is key, but you also can use marketing to help word of mouth work better. Make follow-up calls a few weeks after a sale to be sure your customers feel satisfied. Ask for referral letters from happy ones, and leads on others who might want to buy your work. This way, not only can you contact potential buyers by mail, you also put the idea about spreading your name into your existing customers' heads.

3 Develop an image. Particularly with items that have more artistic than functional appeal, the creator may be as important as the work to customers. Have a graphic designer develop a logo that tells your story. This gives all your other marketing efforts more impact. Use mounted photographs and short, descriptive paragraphs in your booth, on your shop wall, or on a handout to tell how you do your work, how you got into woodworking, and any unusual species of wood or other materials you use.

4 Don't just tell, show. They cost more to print, but business cards with photos of your work help sell. Develop brochures that show potential customers products they may not have known you make. And a photo album of work you've done for past customers stirs the imaginations of new ones. Often, you can trade a professional photographer's skills for items you've made.

5 Put your name on your work. If you sell through retailers, they probably won't want to display your address or phone number for fear customers will buy direct. But you can always put your name and hometown on your work, even on a small tag, to help people remember you.

6 Pay to advertise. This doesn't have to be expensive, as long as you use media that target only the types of people likely to buy from you. Depending on what you make, classified ads in your neighborhood paper or Yellow Pages listings may be perfect. Ads in city magazines or weekly entertainment papers can work, too. Even TV isn't out of the question. Check your local cable system for an inexpensive plan that lets you reach audiences to which your work might appeal.

7 Hang your shingle. If zoning laws permit, and you live on a busy road, a good sign in front of your house could generate all the business you'll ever need.

market

8 Give away your work. For only the cost of your labor and materials, you can donate a piece you built to a charity auction, such as a public television or radio fundraiser, and get some great advertising in the process.

9 Stay in touch with your customers. These kind folks are your best source of future business. Collect names and addresses whenever possible, and a few times a year mail a postcard or note about new products or craft shows you'll be in.

10 Get free publicity. The more unusual your product, the better your chance of getting a feature about yourself in the local newspaper or on TV. Let the media know if you win an award or reach any other milestones. Write and mail a press release about you and what you do, and if possible, include a photograph or two of you and your work.

Remember that no marketing approach is right for everyone, nor should you rely on only one. As in woodworking, experimentation will show you what works best.

Written by Jack Neff, a Batavia, Ohio, business writer and author of *Make Your Woodworking Pay For Itself.*
Illustrations: Jim Stevenson

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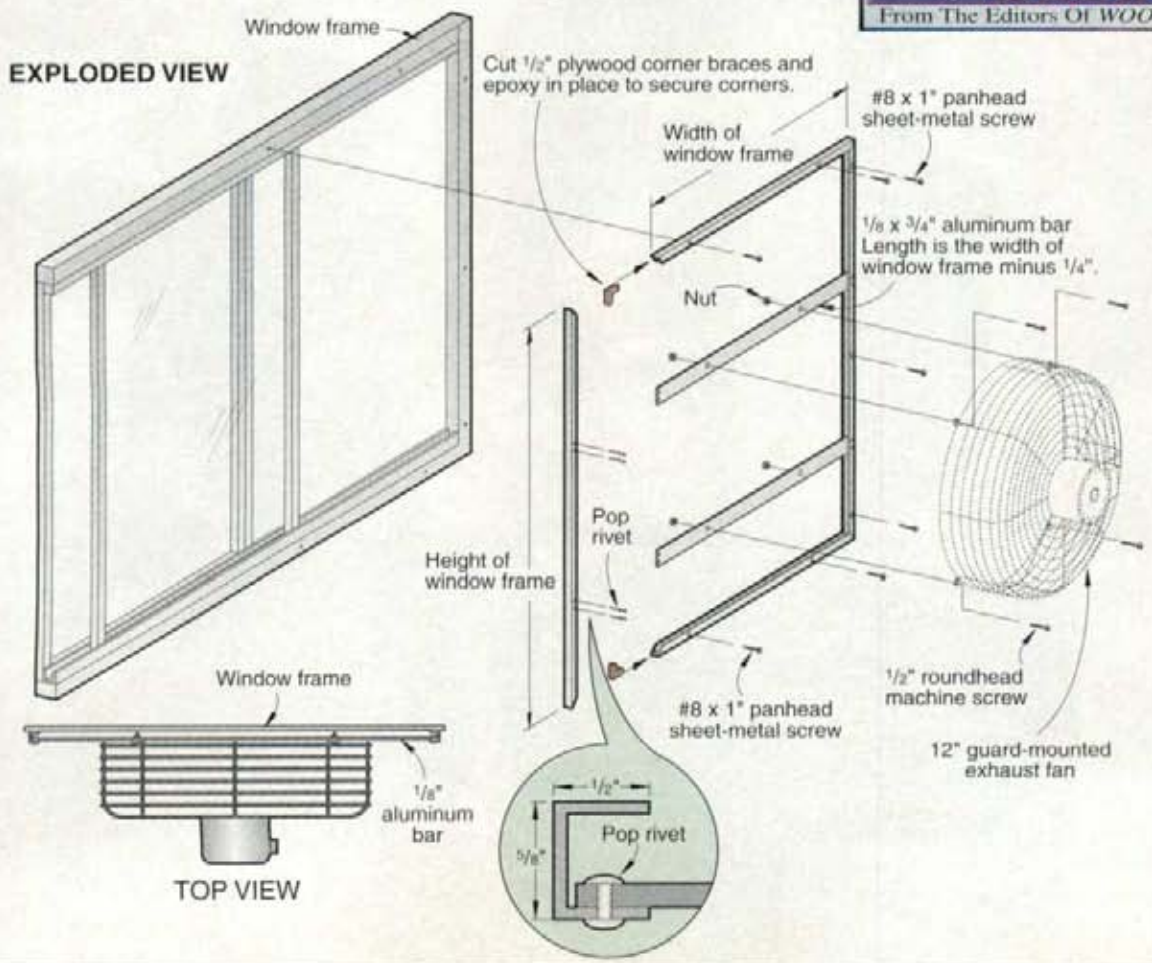
To build the support, we used hardware-store ⅝" aluminum U-channel screwed to our existing metal basement window frame. We pop-riveted the 12" guard-mounted exhaust fan (available from Miller Hardware, 515/283-1724, $129 ppd.) to two strips of ⅛×¾" aluminum that in turn were riveted to the U-channel. The size of the fan will depend upon your window size. Our 12" fan with ⅓₀ horsepower delivers 700 cfm and has a totally enclosed motor suitable for dusty environments.

Smart Solutions For Your Basement Shop

IDEA SHOP 3

From The Editors Of *WOOD*® Magazine


EXPLODED VIEW
Window frame
Cut ½" plywood corner braces and epoxy in place to secure corners.
#8 x 1" panhead sheet-metal screw
Width of window frame
⅛ x ¾" aluminum bar Length is the width of window frame minus ¼".
Nut
Pop rivet
Height of window frame
#8 x 1" panhead sheet-metal screw
½" roundhead machine screw
12" guard-mounted exhaust fan
Window frame
⅛" aluminum bar
TOP VIEW
½"
⅝"
Pop rivet

This Delta exclusive gives you a lock on snipe control. Patent-pending cutterhead snipe control lock stabilizes the cutterhead during operation, for complete rigidity.

Those who've had a sneak preview have nice things to say about it. Priced in the middle of the pack–we're betting it'll end up at the head of its class.

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Properly adjusted infeed/outfeed tables can go a long way toward snipe reduction. A low-friction stainless steel base, in combination with these adjustable infeed/outfeed tables, gives you a large smooth surface for moving stock through your planer.

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RETURN OF THE Mortise Machine

Readers offer solutions to machine's mysteries

We first showed you the Miller mortise-joint machine in the December 1997 issue. Back then, we left you with a question: How does it work? A number of you took up the challenge to explain this thing.

What do those rods do? Are they in backward?

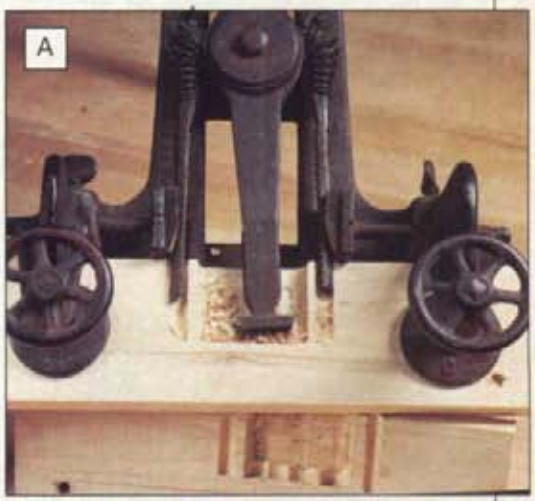
Most speculation about how the Miller machine works centered on those mysterious, toothed rods. Some correspondents wondered if the machine in the photograph had been dismantled, then reassembled incorrectly. "Reverse the rods!" they implored. This way, the rods' teeth would face outward and could grip against the adjustable blocks, helping to advance the cutter into the work.

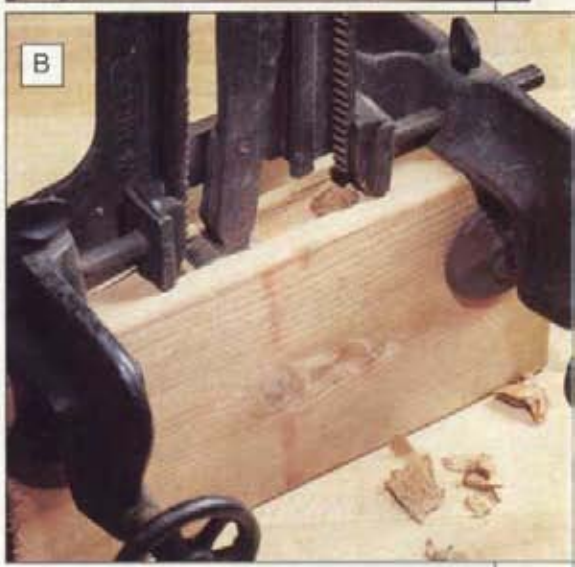
That this machine could have been improperly assembled by some previous owner seemed entirely plausible. But then we heard from Loring McKenzie of Logansport, Indiana.

A tool collector, Loring sent photos of several mortise machines he owns, including a Miller. Close inspection of the photo of his Miller machine showed the rod teeth facing inward. We took this as evidence (though it's hardly conclusive) that the rods were installed correctly on Dick Gowen's machine that we showed.

Is drilling the key?

Loring figures that the Miller machine was intended to finish a mortise first roughed out by drilling. Several other readers focused on that idea of drilling first, too. Some held that the entire mortise would be drilled out, then cleaned up with the machine. Others leaned toward drilling two pilot holes, one at each end of the mortise. The more we thought about it, the more we came to accept the pilot-hole theory of operation. It was best expressed by Tom Oertling, a Galveston, Texas, woodworker trained in archaeology.





With the rods extending into pilot holes as in the section view (*photo A*), the Miller mortise machine works fairly well. (We predrilled the mortise. The machine would have cut cleaner sides had we not.) We had less success when we attempted to define the ends of the mortise with ¼" holes. The machine would only cut this deep (*photo B*).

"I believe that the ends of the mortise were defined by two holes drilled straight down to the depth (and maybe plus a little) of the mortise," he wrote. The rods would then extend into the pilot holes, and the adjustable blocks would be adjusted to press them against the sides of the holes.

"Note that the ratchets are cut so that the rod will move down in the hole, but will bite [into the end-grain wood] if it is pulled up," he added.

Swinging the handle to the right extends the right rod farther into its hole. As the handle moves leftward, the right rod, its teeth pressed against the side of the hole, resists pulling up. At the same time, the left rod advances farther into its hole. This action would advance the handle/cutter assembly, by Tom's reckoning.

"This machine would probably not have left a very clean mortise. No doubt some chisel work was necessary to clean it out," he said.

Is the mystery solved?

We'll let that explanation stand for now. But someday, someone will happen across a yellowed instruction booklet for Miller's Patented Mortising Machine. Only then will we know for sure just how this thing is supposed to work.

Machine courtesy of Dick Gowen, Aurora, Nebraska. Photograph: Hetherington Photography

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Safe Ways to Saw Small Pieces

Are you having a tough time cutting small chunks of wood? Safety man Mike Gililland offers some suggestions.

It seems that whenever a discussion about safety pops up, much of it involves anecdotes (some of them scary) about cutting small workpieces—a task similar to yet unlike thin-strip ripping. A while back, I visited *WOOD*® magazine's web site and clicked on the general discussion group. Sure enough, there were postings on that subject there, too. One seemed to sum up many: "Every close call I've ever had involved making a small piece smaller. Now, I've learned to just say no."

Although there seems to be a general agreement among woodworkers that trying to saw small pieces of wood is dangerous, there's no consensus on exactly how to do it safely. The best method is to shape the piece while it's still part of a larger, more easily handled one.

But if you find that you must sometimes work with small pieces, I know that you can rip and miter them safely on a tablesaw. But, you have to give them firm support. I've found at least two sound ways which I'll share with you to do that. With either, you should install a zero-clearance table insert to keep from getting tiny scraps down into the blade.

Combine a miter gauge and a hand screw

You'll be surprised at what you can accomplish by attaching a scrap board to your miter gauge to serve—not as a fence—but as a backing board for your small workpiece. As you can see in the drawings *below*, by clamping the workpiece to the scrap with a handscrew, you'll be able to make miters as well as straight cuts. Be sure, though, to always use a clamp, such as a wooden handscrew, that won't harm your tablesaw blade should you venture too close.

Clamp up to a universal jig

A bit more complicated than the preceding technique, but sometimes far more accurate for straight cuts (ripping or crosscuts) only, is to pair up a universal jig and two clamps with your small workpiece. A universal jig (about $50 in die-cast aluminum at Sears and elsewhere) slides along the miter slot in your saw table. As shown in the drawing *below*, it brings a small workpiece clamped to it past the blade with control.

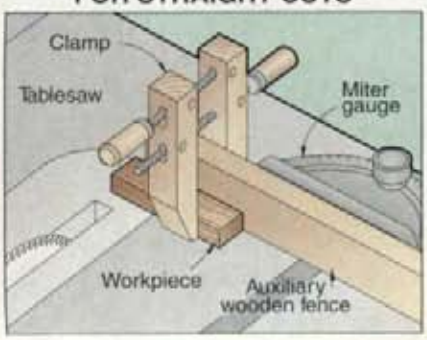
As with the first technique, you'll want to use a wooden hand screw to hold the workpiece. But a C-clamp or other type works fine to secure the hand screw to the jig. Some universal jigs come with a pair of C-clamps attached, but stick with the hand screw for work close to the saw blade.

Now that I've shared two of my favorite ways to cut small workpieces, you don't have to "just say no" anymore. Instead, go ahead and start sawing small, but in control and carefully.

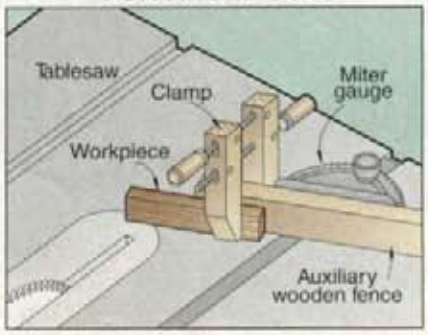
Mike Gililland is a lifelong woodworker and an engineer with 25 year's experience designing and working with woodworking power tools to make them safer. A resident of Missouri, he owns and runs a safety consulting firm.

Send your safety-related questions with a SASE to:
The Safety Man,
WOOD Magazine,
1912 Grand Ave.,
Des Moines, IA
50309-3379.
Not all questions will be published, but all will receive a reply.

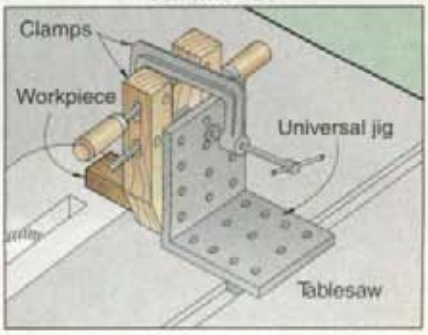
MITER GAUGE CLAMP-UP FOR STRAIGHT CUTS



MITER GAUGE CLAMP-UP FOR ANGLE CUTS



UNIVERSAL JIG CLAMP-UP



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See related article on page 60

Right-Hand-Man Sanding Table

A built-in dust chute links it directly to your shop vacuum or dust collector.

Smart Solutions For Your Basement Shop
IDEA SHOP 3
From The Editors Of WOOD® Magazine

We designed this sanding table to fit a 10" Jet Contractor's Saw. You'll probably have to alter the table's size to fit your particular saw. Dust catchers such as ours aren't meant to replace dust-collection devices you're already using. This one is a site-specific accessory that helps you manage the fine dust that results from using a handheld pad sander. Note also the handy built-in tool tray for storing sanding blocks, pushsticks, and other workshop items.

Build the table as shown in the Exploded View *at right* to fit your particular saw. We used a piece of perforated hardboard to mark the numerous hole locations. Drill the holes and then countersink them slightly. Use a piece of duct out the back of the unit to fit your dust-collection system or shop vacuum.

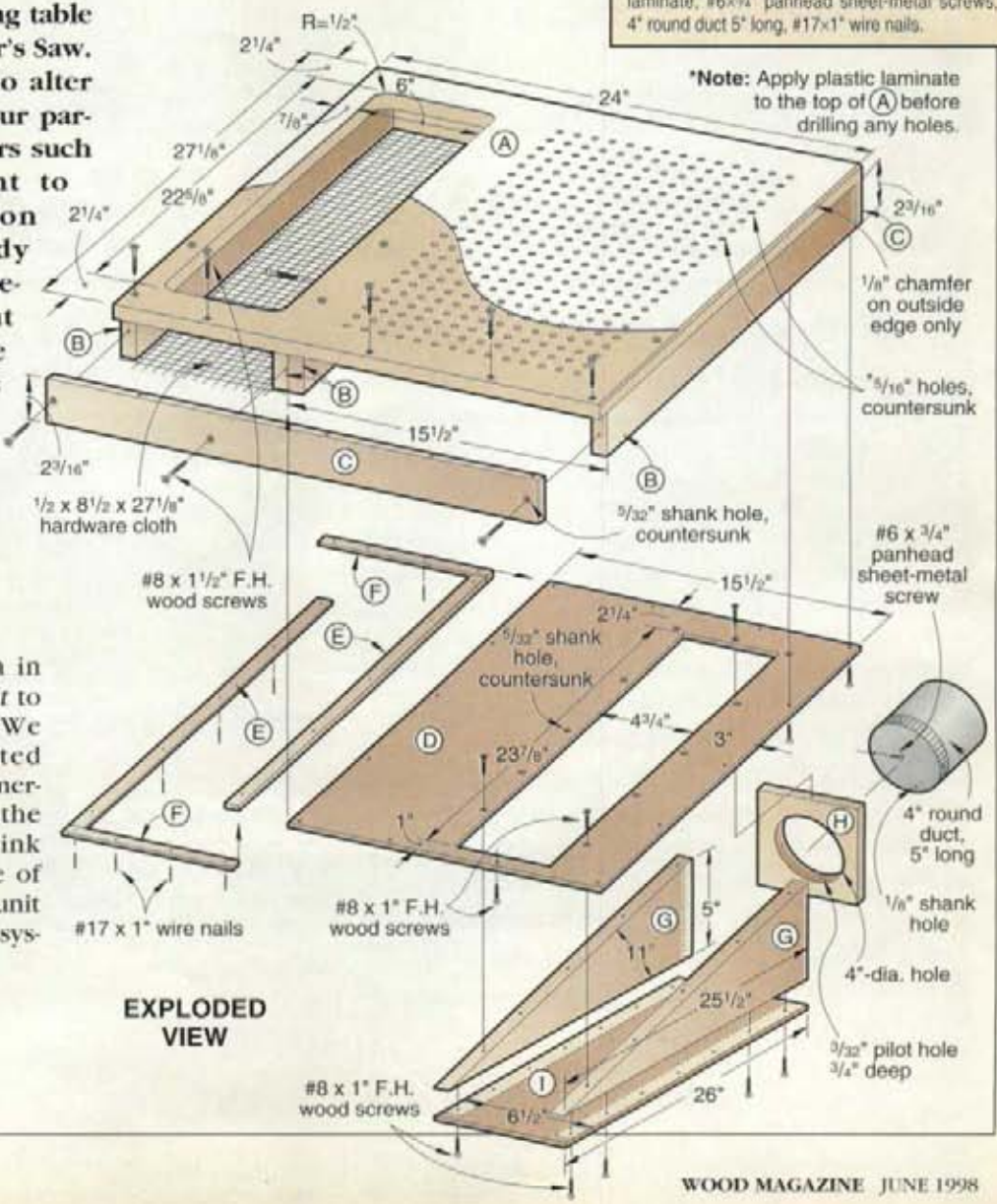
Project Design: James R. Downing
Illustration: Lorna Johnson
Photograph: Hetherington Studio

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
SANDING TABLE					
A tabletop	¾"	24"	27⅛"	MF	1
B spacers	¾"	2⅜"	25⅛"	H	4
C end caps	¾"	2⅜"	24"	H	2
D bottom	¼"	15½"	27⅛"	HB	1
E screen molding	3/16"	¾"	25⅛"	H	2
F screen molding	3/16"	¾"	8½"	H	2
DUST CHUTE					
G sides	¾"	5"	25½"	H	2
H end cap	¾"	5"	5"	H	1
I bottom	¼"	6½"	26"	HB	1

Materials Key: MF–medium density fiberboard, H–hardwood (maple or birch), HB–hardboard.

Supplies: #8×1" flathead wood screws, #8×1½" flathead wood screws, ½" hardware cloth, plastic laminate, #6×¾" panhead sheet-metal screws, 4" round duct 5" long, #17×1" wire nails.



EXPLODED VIEW

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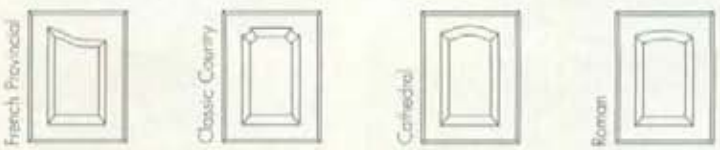
Need help with the how-to?
Look for the four template styles to make the profiles shown below and the video 'Arched Raised Panels Made Easy' by Marc Sommerfeld both available in the new CMT catalog.



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Top Tip winner Dick Diedrich discovered a woodshop application for an electronic stud finder.

Dick Diedrich has been working with wood as a hobby for as long as he can remember. Last year, he went into business full-time with his "Woodworks-Plus" venture. The plus: "I have a machinist's background and can make my own metal components for woodworking projects," Dick told us.

Today, Dick gets more work than he can handle just through word of mouth, so he can't be slowed down by goofs. That's why he came up with the inventive idea at *right*.

Like Dick, you've probably come up with your own unique solutions to woodworking problems. If so, your idea may be worth $40. And if it's selected as the Top Shop Tip, you'll win a tool prize valued at $250 or more. To submit a tip, send a letter, including your daytime phone number, and a photo or drawing of your idea, to:

Tips From Your Shop (And Ours)
***WOOD*® Magazine**
1912 Grand Ave.
Des Moines, IA 50309-3379

We try to publish original shop tips only, so please send your idea only to *WOOD* magazine. Also note that we cannot return submissions. Thanks!

Dave Campbell

GENERAL-INTEREST EDITOR

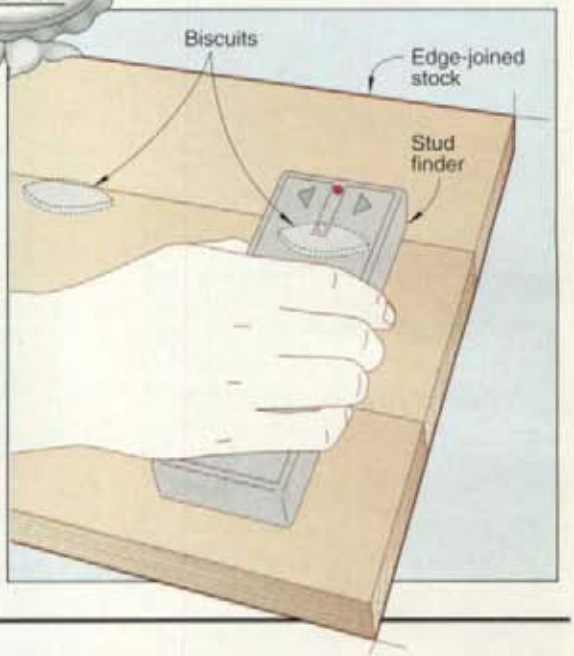
Biscuit, biscuit, where's the biscuit?

After marking and installing biscuit joints in several boards that I've glued up edge-to-edge, I then plane the glue-up to thickness and rip it to finished width. The problem is that in the process I also remove the marks that show where the biscuits are located. Later, when crosscutting the glue-up to length, I sometimes cut through one of the biscuits—and that leaves me with a very unattractive edge.

One day, while gluing up some long pieces of oak, I grabbed my electronic stud finder and ran it along the seam. To my surprise, it located every biscuit in the boards. Now, I never have to guess!

—Dick Diedrich, North Lake, Wis.

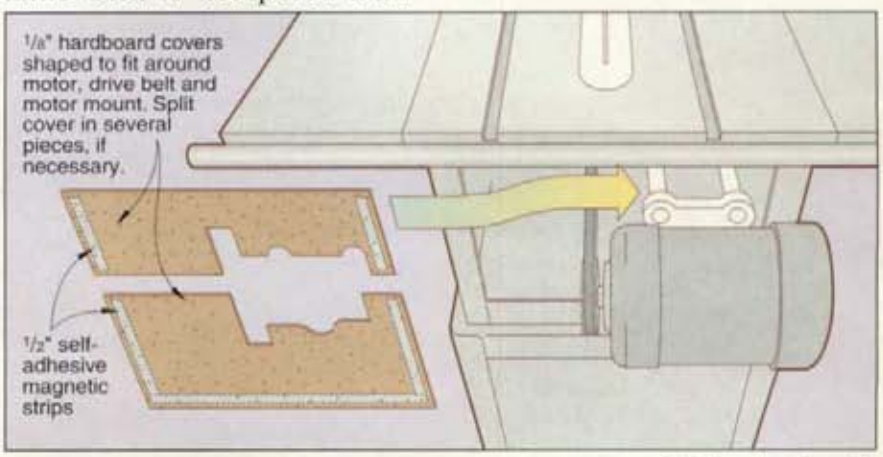
A Porter-Cable model 9872 14.4-volt cordless drill kit goes to shop tip whiz Dick Diedrich.



A low-tech way to help contain tablesaw dust

Making some removable covers that fit over the large openings at the front and rear of your tablesaw greatly increases the efficiency of your dust collector. I made mine with ⅛" tempered hardboard and sticky-back flexible magnets from a crafts supply store. When I need to tilt the blade, I just pull off the covers.

—Randy Lee, Fairfield, Ohio


¼" hardboard covers shaped to fit around motor, drive belt and motor mount. Split cover in several pieces, if necessary.
½" self-adhesive magnetic strips

Continued on page 24

No matter how you cut it, Pro-Tech's Miter Saws are the best choice for studs.

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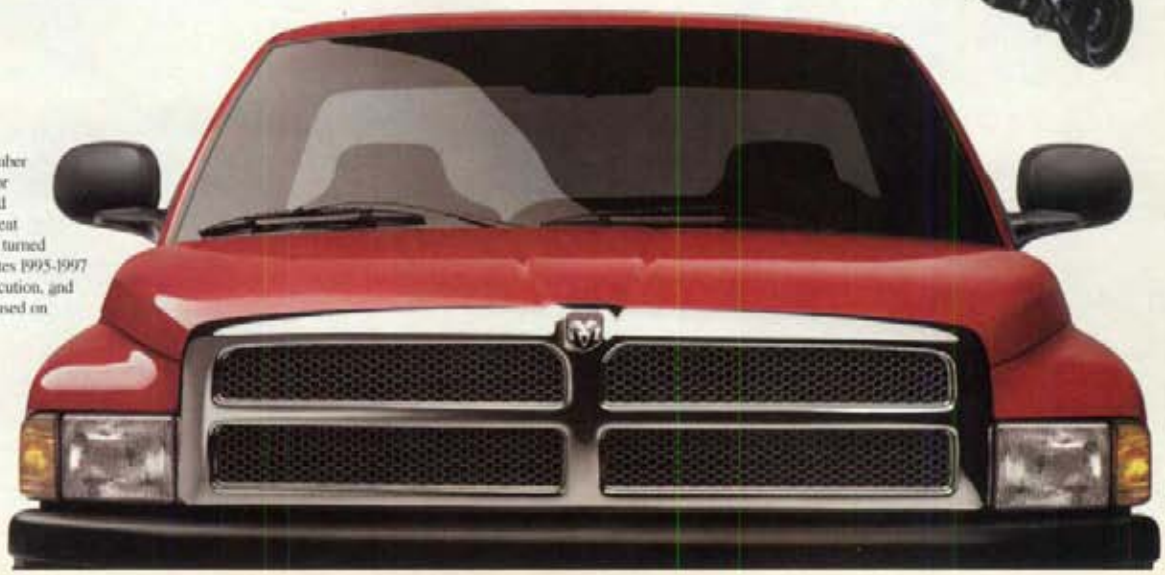


†Always use seat belts. Remember a backseat is the safest place for children. Rearward-facing child seats can be used in the front seat only with the passenger airbag turned off. *J.D. Power and Associates 1995-1997 Automotive Performance, Execution, and Layout Studies.℠ 1997 study based on 29,187 consumer responses.

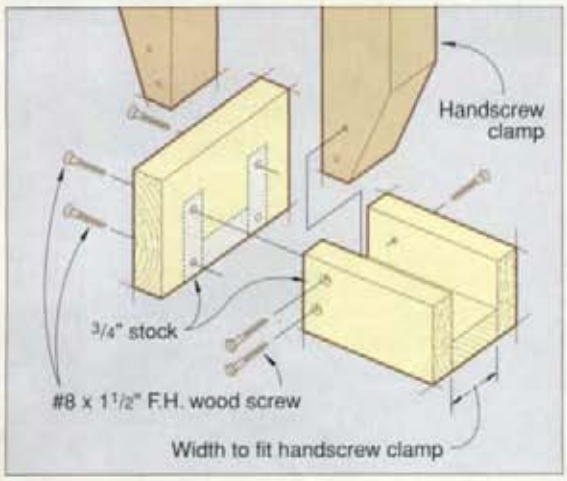
Continued from page 20

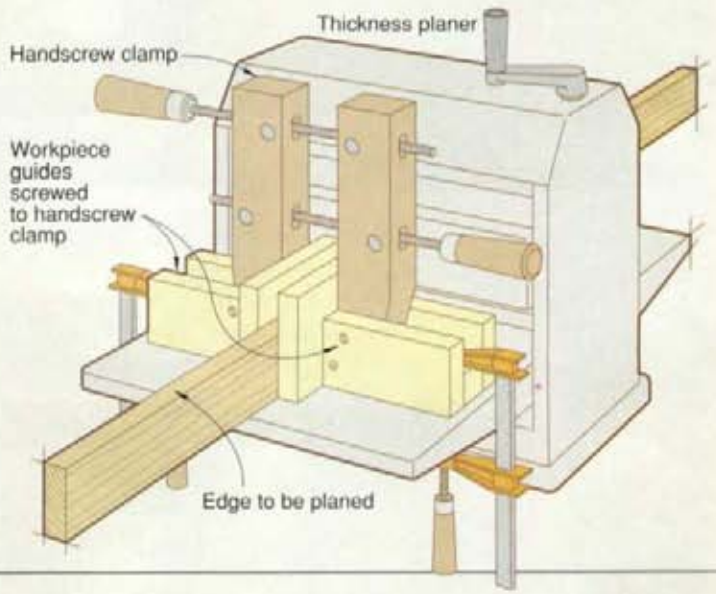
Cut workpieces to uniform width with your planer

With an old handscrew clamp and some scraps of hardwood you can use a thickness planer to make uniform-width cabinet stiles, rails, and other pieces with jointer-smooth, square edges, as shown *below*.

Prepare your workpieces by jointing one edge and ripping the other edge so the workpieces are slightly too wide. Then, clamp down one of the workpiece guides to your planer's infeed table, and adjust its face 90° to the planer table. Adjust the face of the opposite guide so the stile fits snugly between the guides. Clamp the other guide down. Use the handscrew clamp to fine-tune the snugness of the guides and the workpiece.

—Bob Killian, Lubbock, Texas





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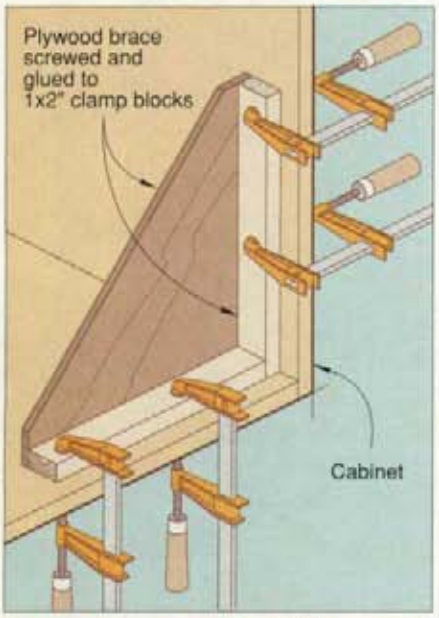
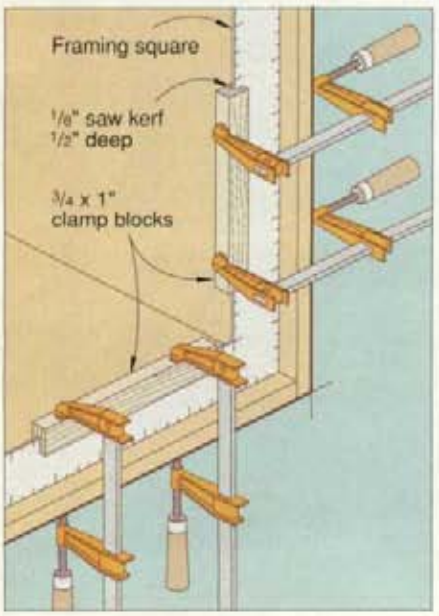
Squaring up a cabinet assembly

Here are two simple methods I've used to square up cabinets. If you build a lot of cabinets, you'll find plenty of use for plywood braces like the one *below*.

If you don't want to store or build such braces, just groove two blocks of wood to fit snugly over the blades of a framing square as shown *bottom*. These clamp blocks provide the clamp jaws with surfaces to bite against.

—Tom Moore, Clarksville, Va.





Continued on page 26

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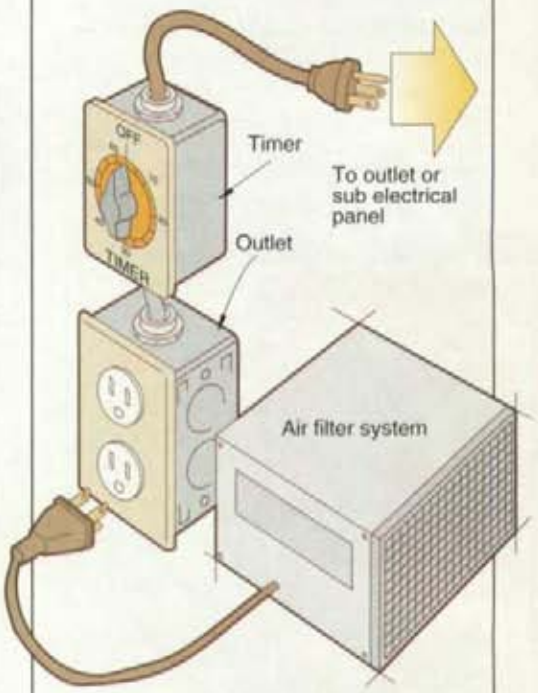
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 25

Timer delays air filter shut-off

I installed an air-filtration unit in my shop, and plugged it into a 60-minute timer-controlled outlet. This lets the blower continue to pick up any dust that might be suspended in the air after I leave. Now I don't have to remember to come back later to turn it off.

—Joseph Hart, Grand Rapids, Mich.



A FEW MORE TIPS FROM OUR WOODWORKING PROS

- To put a fast, lustrous finish on a turning, try padding lacquer. Make your own using our recipe on *page 59*.
- Learn safe ways to cut small workpieces. See "Where Safety Begins" on *page 16*.
- Save some sanding by first sawing screwhole plugs flush with a surface. Turn to *pages 33-34* to see what kind of saw does this without marring.
- See how we used joint-strengthening splines in a three-legged pedestal. It's on *pages 48-49*.

WOOD ANECDOTE

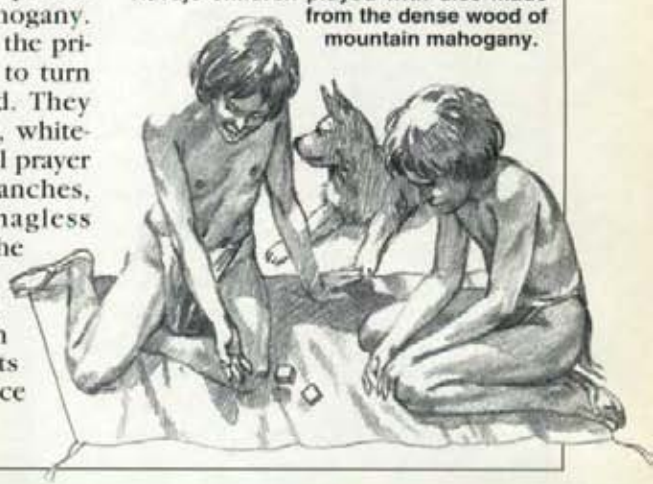
The West's favorite fodder Mountain Mahogany

There's a small tree dotting the American West that stockmen like to call sweetbrush. That's because domestic cattle, sheep, and goats (along with deer and other wild creatures) relish its foliage in the warmer months. In winter, after the leaves have fallen, twigs become the main course.

This culinary cellulose delight is the mountain mahogany tree (*Cercocarpus spp.*), which appears in three varieties. Each, though, shares many of the same characteristics. The short, stout trunk can attain a 40' height, although you'll commonly find them at 15' with many a twist. Contorted branches also mark this tree, giving it a totally unkempt look.

In spite of the mountain mahogany's odd, disheveled image, the wood rates as quite attractive. In fact, the stocks' deep brown color and hardness prompted the mahogany name for this species, which isn't a mahogany at all. You'll find the wood heavy, too. Freshly cut, it won't float. And although brittle, the wood was frequently utilized by Native Americans for bows.

The Navajos made perhaps the best use of mountain mahogany. An extract of its roots was the primary ingredient for a dye to turn their woolen blankets red. They also employed the fruiting, white-plumed twigs as ceremonial prayer sticks. Short, straight branches, when peeled, were snagless implements for handling the women's weaving threads. Navajo men, though, had the most fun with mountain mahogany. They crafted its wood into long-wearing dice for gaming.



Navajo children played with dice made from the dense wood of mountain mahogany.

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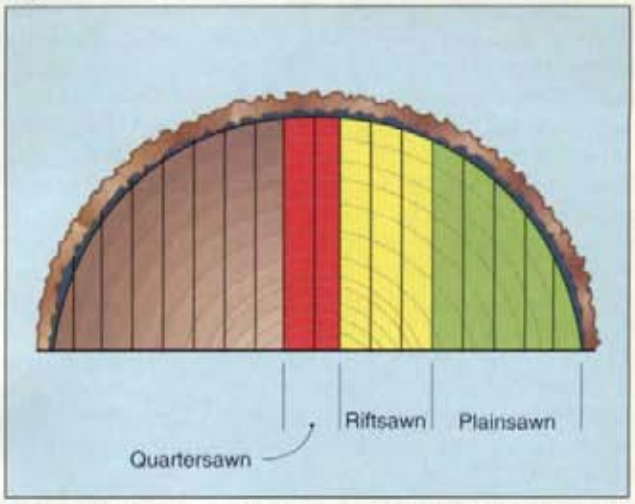
There's more than one way to cut a log

I've read articles explaining the differences between flatsawn and quartersawn lumber. Over the years, I've also seen the term "riftsawn lumber," but I've never seen a definition for it. Does riftsawn lumber have any special properties or uses?

—Dan Borcyk, Omaha Neb.



Sawing through and through a log produces quartersawn, riftsawn, and plainsawn boards.

Dan, *riftsawn* is the word used for lumber that has been cut at no less than 35° and no more than 65° to the annual rings in a log. The word *bastardsawn* is also used for this type of lumber. Most riftsawing is done at about 45°. The best description we've heard comes from Lisa Flittner, of Paxton Lumber Co. in Kansas City. She explained that boards riftsawn from a log resemble the spokes on a bicycle wheel. The cut follows a path from the center, and travels at an angle across the tree to the outside. Quartersawn lumber, on the other hand, is cut straight from the core to the outside.

When you look at a riftsawn board, the end will have growth rings angled at about 45°, and the face will be so straight-grained that it's often called comb-grained lumber. These boards also have long sweeping stripes resulting from the rays that run from the center of the tree to the bark. These same rays show up as specks in quartersawn lumber, and don't appear at all in flatsawn lumber.

You may find riftsawn boards hard to come by, even though they prove to be as strong and as stable as quartersawn boards. That's because sawyers have to spend more time and create more waste, when cutting riftsawn stock. You'll mostly find riftsawn boards in oak, because of the desirability of the ray and grain figures. But other hardwoods can be ordered riftsawn. This type of wood is also the most expensive. In oak, it costs about a dime more per board foot than quartersawn lumber, and $1.60 more than flatsawn stock.

A-quartersawn, B-riftsawn, C-plainsawn

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Continued on page 30

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ASK WOOD

Continued from page 28

A question of compatibility

I built a curio shelf and want to use some white shellac as a sealer coat. I then plan to spray lacquer for the topcoats. Are these finishes compatible, or will the piece start to peel or do other strange things down the road?

—Laurie McDougall, Vancouver, B.C.

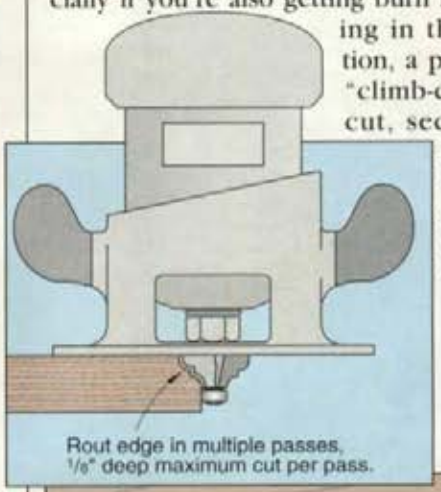
No problem, Laurie. In fact, shellac is often used as a sealer under lacquer because it sands easily and lacquer readily bonds to it. Your concern about peeling and "other strange things down the road" probably stems from the fact that ordinary shellac, straight out of the jar, contains wax. This wax can cause compatibility problems with some other finishes, most notably polyurethane.

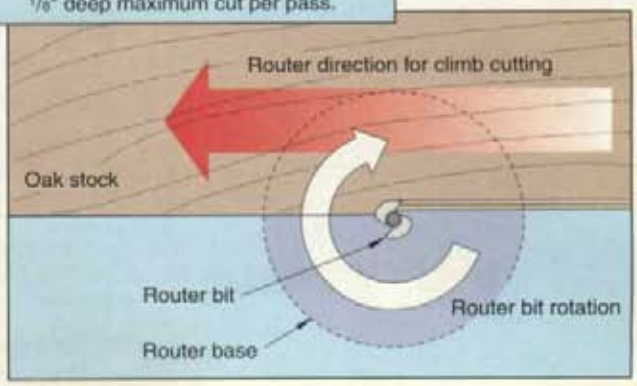
Taming the splintering in oak

In spite of all my efforts, I have trouble with splintering whenever I try to rout an oak edge. I use new, quality bits and I remove the material in multiple passes. Would a speed reducer help, or should I make even shallower passes?

—Al Davidson, Hardwood, Ont.

Slowing down your router's rpm will help, Al, especially if you're also getting burn marks. So will routing in the opposite direction, a procedure known as "climb-cutting." To climb-cut, securely clamp your stock to a worktop—and get a good grip on the router, because it will try to pull itself through the wood. Make a series of slow, shallow climb-cut passes for good (and safe) results.



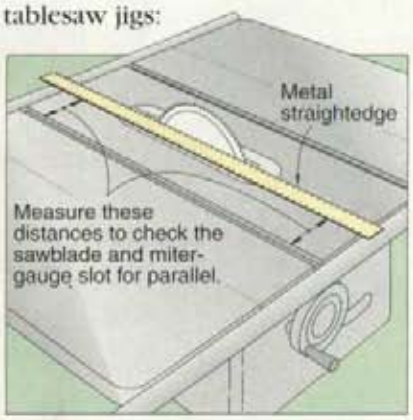


How to get smoother-running jigs

I have trouble keeping the runners that fit into the miter-gauge slot of my tablesaw parallel to the blade when I make saw jigs. Do you have any suggestions that might help me?

—Mike Chambers, Winston-Salem, N.C.

Mike, first check that the saw blade runs parallel to the miter-gauge slots. Do this by placing a straightedge against the side of the saw blade (be sure the straightedge rests against the side of the blade and not against the projecting teeth). Then, measure the distance from the ends of the table slots to the straightedge (see drawing *below*). If needed, adjust the blade alignment according to the saw manufacturer's manual. With the blade parallel to the slots, follow these steps for smoother-moving tablesaw jigs:

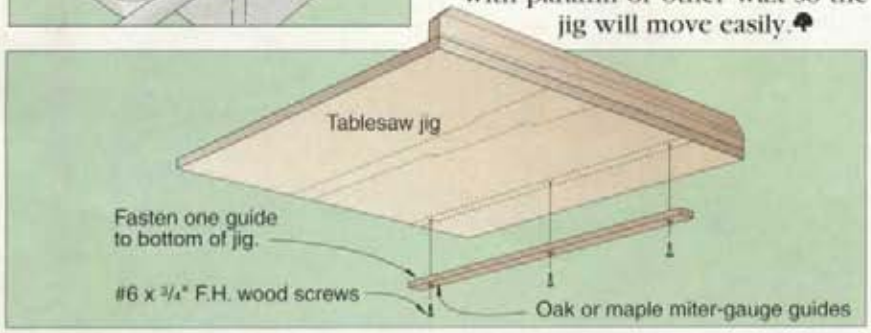


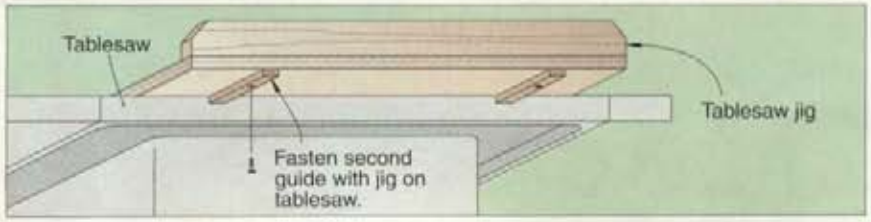
1 Cut ⅜×¾" (or sized to snugly fit your tablesaw slots) oak or maple strips for the runners a few days ahead of building the jig. Cut extra pieces, and stack and sticker these to allow them to stabilize. Then, select the straightest two sticks to use for your jig runners.

2 Next, glue and screw one runner into position on the bottom of the jig. Allow the glue to set, and scrape off any glue residue.

3 Place the second runner in the other miter slot, apply glue to its top surface, and then set the jig in place on the tablesaw. Slide both the jig and second runner slightly over one edge of the table and fasten the runner to the jig base with a small wood screw. Repeat this procedure on the other end of the runner. Finally, drive a third screw down through the jig surface and into the center of the hardwood runner while the jig is on the saw.

4 When the glue on the runners dries, slide the jig back and forth in the miter-gauge slots to check the fit. Areas of the runners that bind against the sides of the miter slots will develop a metallic sheen from rubbing the metal. Abrade these areas with a sanding block to ease the motion of the jig. Then, lightly coat the runners with paraffin or other wax so the jig will move easily.





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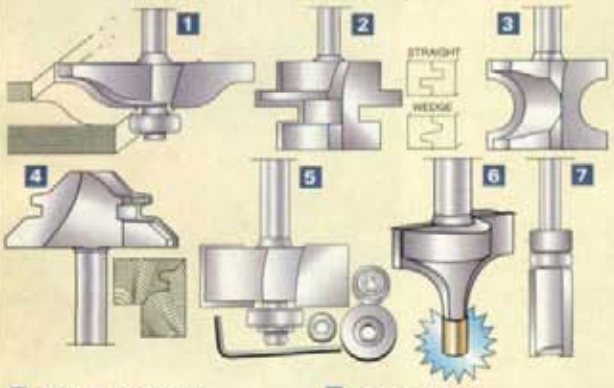

1 OGEE RAISED PANEL
#1423 2" Large Diameter **$29.95**

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#1331 3/4" Dia. of Circle **$21.00**

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2" Dia., Stock thickness: 1/2"-3/4" .. **$37.50**

5 RABBETING KIT
Ball bearing guides allow 4 depth of cuts: 3/8", 7/16", 5/16", 1/4". Set: 1/4" shank rabbeting bit, 4 bearings (3/8", 1/2", 5/8", 3/4") & hex key.
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6 BRASS PILOTED
Rout into tight spaces and sharp corners. These bits have Brass Pilots, measuring only 5/32" in dia., instead of the usual 1/2" ball bearing.
#1428 1/8" R Round Over **$16.00**
#1429 1/4" R Round Over **$17.00**
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7 PATTERN/FLUSH TRIM
#1340
1/2" Dia., 1" Cutting length. **$15.00**
#1341
3/4" Dia., 1" Cutting length **$17.00**

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Drill accurate holes in wood, plastics & composites.

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FAST AND EASY

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1/4" Shank Carbide Tipped

Round Over/Beading Bit Set

Set includes: 4 Round Over Bits with 1/2" OD bearing: (1/8", 1/4", 3/8", 1/2"), plus 3/8"OD bearing & allen wrench.

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$72 Individually.. **SALE $39.95**

1/4" Shank Carbide Tipped

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This production quality set includes 4 Cove Bits: (1/8" R, 1/4" R, 3/8" R, 1/2" R).

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4 Helpful Handsaws

Some handsaws you can count on include the Japanese Ryoba (A) and Dozuki (B), a flush-cutting saw such as the Japanese Kugihiki (C), and a short, hard-tooth toolbox saw like the 14" and 20" ones here (D).

When it comes to ripping and crosscutting, the power tablesaw reigns as the workshop workhorse. What's more, most shops boast various other motorized saws. Even so, you'll still run into woodworking situations that call for a handsaw. Here are four we rely on in our shop.

Japanese saws

Make a few cuts with the unusual-looking Japanese Ryoba and Dozuki (A and B in the photo *above*), and they could easily become your favorite handsaws. Functionally, these Far Eastern saws differ significantly from traditional Western models: They cut on the pull stroke. This allows another departure from the handsaws you knew in shop class—the Japanese saws have thinner blades. That's because they're in tension—being pulled taut—rather than compression while cutting. This minimizes the danger of the blade wobbling or buckling on the cutting stroke.

And the blades not only are thin, they carry sharp, aggressive teeth. The Dozuki may have as many as 26 teeth per inch, making it an excellent tool for precise joinery. The double-edged Ryoba carries 6-10 teeth per inch on one edge and may have as many as 22 per inch on the other. The coarser edge is generally considered a ripsaw; the finer one, a general-purpose crosscut saw.

With no tooth set and a flexible blade, the flush-cutting Kugihiki can saw right against a surface without marring it.

Flush-cutting saw

When you need to trim one piece flush with another, reach for another Japanese-style saw—the Kugihiki, marked C in the photo.

Lay this saw's thin, flexible blade right against a surface and saw away, as shown *left*. You won't mar

Continued

Continued from previous page

Handsawing tips and tricks

Here are a few tips and techniques that will help you get the most from a handsaw.

•Keep it sharp. You can learn to file the teeth yourself or have a pro sharpen your saw. Hardened teeth probably will require grinding, a job for a sharpening shop.

•Hold it straight. With a D-handle, extend your index finger along the side, as shown *below*. This helps keep your hand and wrist aligned on the handle. When you grasp the Japanese saw's straight handle, place your thumb along the top. Keep the handle aligned with your arm.

•Cut with long, smooth strokes. Speed isn't critical; you'll do better to maintain an even cadence. Your elbow and the saw blade should move along a line in the same vertical plane.

•Watch the reflection in the saw. You can make sure you're cutting squarely by keeping an eye on the reflection of the workpiece in the saw blade. When it appears to run straight through the saw as shown *below*, you're square.

Keep your cut square by watching the workpiece and its reflection in the saw blade. When both line up straight, you're sawing squarely.

the surface because the blade's teeth are not set to the sides, as is common with most other saws.

This saw comes in handy for fine trimming—sawing the ends of an onlaid molding flush with the ends of a drawer front, for instance. You'll find it useful in making wedged joints and through mortises, as well as for trimming box-joint fingers after assembly. And once you've tried it, you'll probably adopt this as your standard tool for trimming screw-hole plugs flush with a surface. The lack of set does make it impractical to use the saw for deep or long cuts.

Shorty toolbox saw

You'll make short work of sawing when you wield an abbreviated traditional-style saw like the ones labeled D in the photo. Most manufacturers now offer one or two of these short saws, edged with aggressive, hardened teeth.

Generally about 14–20" long, the blade may have 8–14 teeth per inch. Though thick and coarse-toothed in comparison to the Japanese blades, these saws make surprisingly clean cuts. They cut fast (many cut on both push and pull strokes) and stay sharp through much use.

In the workshop, you'll like this saw for quickly cutting stock to rough size and other general work. And if you tackle home-repair or remodeling jobs, you'll appreciate this saw's handy size, versatility, and cutting ease.

Photographs: Hetherington Photography

To a Kubota TG owner, mowing the lawn is not a mere chore. It's a pastime, a passion, an obsession. Perhaps that's because the new Kubota TG is more than a mere lawn mower. Built like a sports car, this highly advanced tractor comes fully loaded with electronic rack-and-pinion steering, Cushion Ride Suspension and an 18-hp liquid-cooled gas or diesel engine. Which all adds up to the smooth, quiet, comfortable ride you've always dreamed of. For more details, and possibly a new fixation, call 1-888-4-Kubota, ext. 116.

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WE'RE NOT SAYING THE HEAVENS OPENED UP THE MOMENT THE BT3000 WAS CREATED. THEN AGAIN, IT WAS RATHER BRIGHT THAT DAY.

[Shown with optional accessories.]

The sliding mitre table with precise mitre fence promotes smooth, accurate cuts. Long mitre rip fence optional. — A

The 10" carbide-tipped blade and 15-amp motor rip even nominal 4x4 stock with near-jointer quality. — B

Sturdy steel work stand provides a stable base for workshop and job site operation. Casters optional. — C

Sliding rails and tables allow extra support for right-or left-of-blade operation. — D

When using the adapter kit, table accepts inverted jigsaw or router, providing jigsaw and shaper functions. — E

Self-aligning rip fence automatically locks parallel with blade for straight, precise cuts. — F

First, we gave the BT3000 capability no contractor table saw could touch. Then, to raise the BT3000 even further above mere, mortal table saws, we created many accessories. From oversized tables to a micro-positioning device. Thus creating something truly unique. A precision woodcutting system with unmatched versatility. At a price that's far more down to earth.

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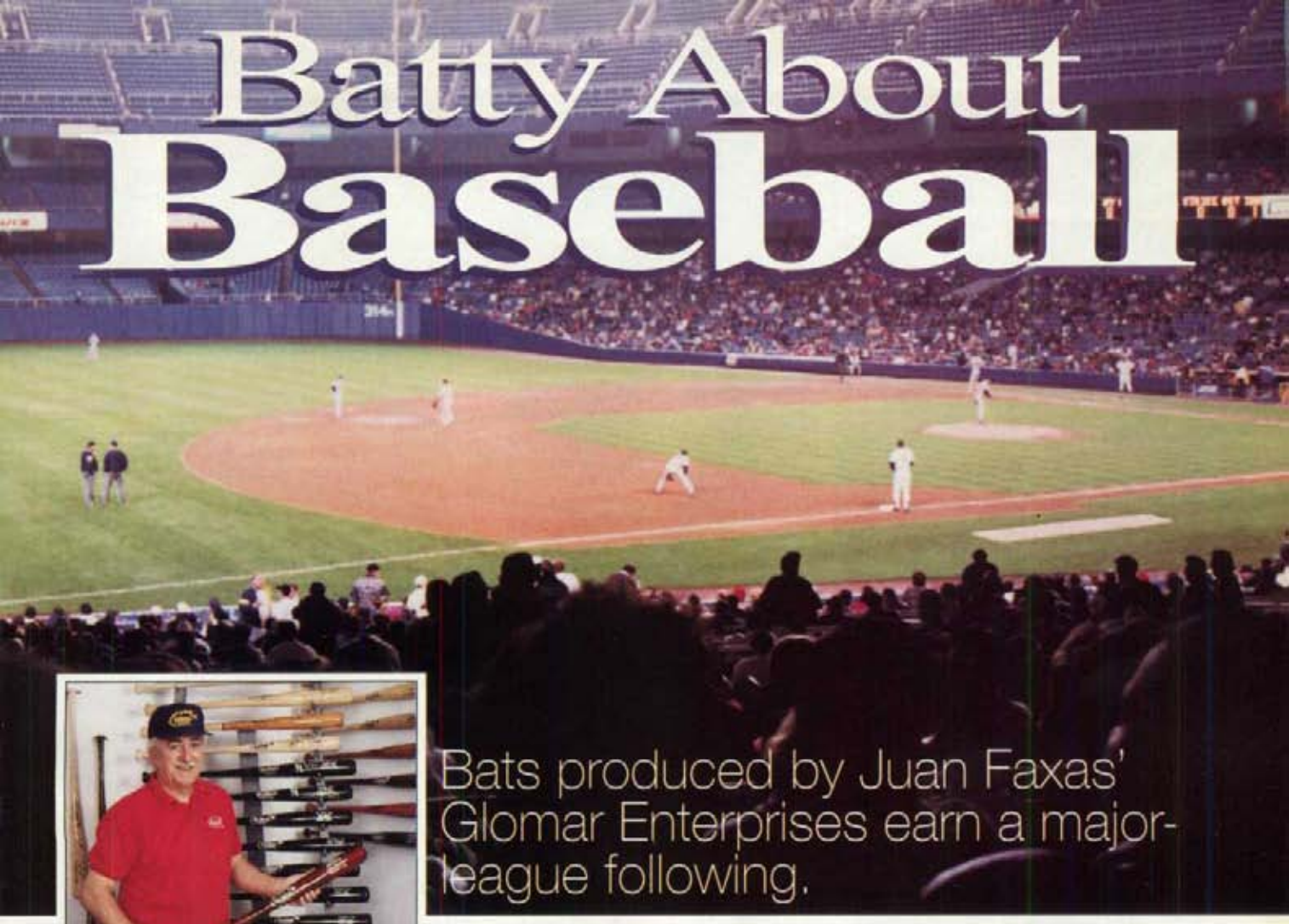
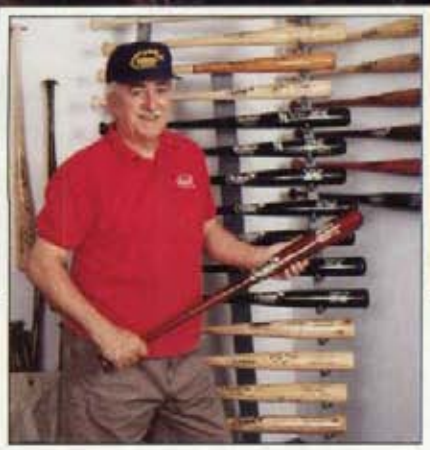
PRO FEATURES, AFFORDABLE PRICES.

Batty About Baseball



Bats produced by Juan Faxas' Glomar Enterprises earn a major-league following.



Glomar Enterprises' owner Juan Faxas shows off one of the master models he uses to turn bats for a major-league customer.

"Every bat is going to break, and thank God for that. Otherwise I would not make a living," quips Juan Faxas. He owns and operates Glomar Enterprises, a Fullerton, California, company that turns baseball bats for the pros. His customers include Jose Canseco (Oakland A's), Andres Galarraga (Colorado Rockies), Tony Gwynn (San Diego Padres), Rickey Henderson (California Angels), Ryan Klesko (Atlanta Braves), Eddie Murray (Los Angeles Dodgers), Charlie O'Brien (Toronto Blue Jays), Tim Salmon (California Angels), and Omar Vizquel (Cleveland Indians).

Juan, 57, loves the game of baseball passionately and prides himself on the quality of the bats that carry his GLOMAR imprint. They're made from the finest, slow-grown white ash from the Northeast—hand-selected, dense wood with straight grain, no visible defects, and kiln-dried to perfection. They're custom-made to each major-league player's specifications. Yet, even the best of bats can't last forever.

White ash at the plate

"Wood is wood. Unless I x-ray every single piece, it is impossible to see exactly what Mother Nature has done to the wood—how the cells line up or if there's an imperfection within," Juan points out.

Although he uses the choicest ash for his bats, it's the players who have the final say on how long a bat will last. "In the heat of a game, a player swings the bat wrong and it gets hit on the handle or the tip," he notes. "Then the bat is going to go, no matter how good the wood is or how well I turned it.

"Yet, I have bats that have had 1,000 hits without cracking or splintering," he adds, "and the integrity of the bat is still there. Some players break a lot of bats, though, because of the way they hit; others don't. It can be the power of the swing, how strong the guy is, how rough he treats it. There are a lot of factors. A bat is a piece of wood. The player behind it makes it work."

Continued

"Every bat is going to break,

Juan inspects a 3⅛×3⅛" white ash bat blank for grain straightness and imperfections, such as tiny knots. Only the best wood will hold up to the 90-mph-plus pitches of the major leagues.

From each player's specifications, Juan turns a master model. Some players like skinny bats; others prefer more bulk.

Copy lathes like this duplicate the master model to produce the 100 or so bats each player orders for the season.

Each of Glomar's 110–120 major-league customers orders 8–10 dozen bats per season, paid for by the team. But the reason they order so many is not due to breakage, according to Juan. "They have so many fans that they autograph their bats and give them away."

A bat supplier to the pros must be licensed by Major League Baseball, and adhere to the restrictions imposed. "The barrel of the bat can be no larger than 2¾" diameter and its total length no longer than 42". And of course, you can't add any foreign substances, like lead or cork or anything else, without the possibility of losing your license," explains Juan.

Within those restrictions, every player has his preferences for length, thickness of handle and barrel, taper from barrel to handle, and weight (between 32–38 ounces). "Bats are extensions of the players, and one of the most important tools they have," says the woodturner. "And making one is more complicated than you would think, especially when it has to hold up to a ball thrown at over 90 mph."

Juan scans the master models of bats on the rack, then adds, "There's a tendency toward skinny bats now. Why, a player with good eyes and coordination can hit with a broomstick!"

But won't a skinny bat lack punch? "Skinny bats allow me to use denser stock for a harder bat than one with a full-sized barrel. But that's as much as I'll tell you," Juan hedges. "The wood I select for a particular bat is a secret of the business."

Within the size restrictions imposed by Major League Baseball, bats take on a variety of shapes, and end up as individual as the players who swing them.

A sandlot beginning

Juan founded Glomar Enterprises in 1991 after player agent Mario Valdes spotted his bats at a Little League game. Back then, woodturning was a hobby for Juan, something he did to make items for his home and toys for his children—the bats included. By day, he worked as an electrical engineer for a major company, a position Juan had striven for since immigrating from Cuba some 30 years earlier.

and thank God for that."

Before final finishing, each Glomar bat gets a company brand decal and a silk-screen imprint of the player's and team's name. Each of Juan's big-league customers orders 8–10 dozen bats per season, and gives many of them away to fans.

California's air-quality laws demand that bats receive a coating of water-based finish. Each will get up to four coats.

"Even as a child in Cuba I loved baseball. I got up with a baseball glove, ready for the sandlot," he fondly recalls. "My father taught me woodturning when I was 12. He was a hobby turner, making chairs, and bats for me. Out of all his shop tools, the lathe held the most fascination for me. Bats were the first things I turned."

Juan found major-league bat-making tougher than providing sticks to the local kids. One batting practice at Dodger Stadium turned his finely crafted bats into kindling. "My supplier had sent me furniture-grade wood. I learned to be more specific."

Juan's friend Valdes lined up the help of major-league players to test bats. Those tips got the business going. One thing he learned was how fussy pros can be. "At first, I turned 4-5 bat blanks to get the specifications right," Juan says. "Even now, it usually takes 2-3 bats to get a customer's specs as they want them."

Glomar goes for a homer

When he started making bats commercially, Juan turned them all by hand. To get the rounded barrel and handle just right, he made special skews. Now, with nine employees, a pair of copy lathes, and an automatic one, the only hand turning Juan does is to create the master bat for each of his customers' models, now hovering at nearly 200 different bats. The copy lathes rough out the bats for the rest of the order.

Today, Glomar's production starts climbing during spring practice and continues to the World Series. That means a peak of between 200-300 bats per day, 5½ days a week. "It's really crazy during baseball season," exclaims the woodturner.

At Glomar, bat production begins with inspecting the specially ordered ash stock, milled to 3⅛" thickness. "We have to weed out the wood that we don't think can take the punishment," Juan explains. "Wood with defects we sell for table legs or something. Then, we rip the good wood to 3⅛" wide for a turning blank."

After the bat blanks are rough-turned to predetermined shapes on copy lathes, they're hand-turned to finish quality. Automatic sanders smooth them while they're still mounted. Workers then apply a water-based sealer to the bats before another sanding with 400-grit. Then, some receive paint. Others are stained, followed by a coat of clear water-based finish, which readies the bats for decaling with the GLO-MAR brand and silk-screening with the player's name. More clear coats are added after that.

"We end up with three, sometimes four, coats of sprayed-on clear finish," says Juan. "Ash is difficult to finish because it's very porous wood. And in California, air-quality laws won't allow us to use regular lacquer, which would fill the pores faster with buildup. But, the water-based finish does stand up to a beating."

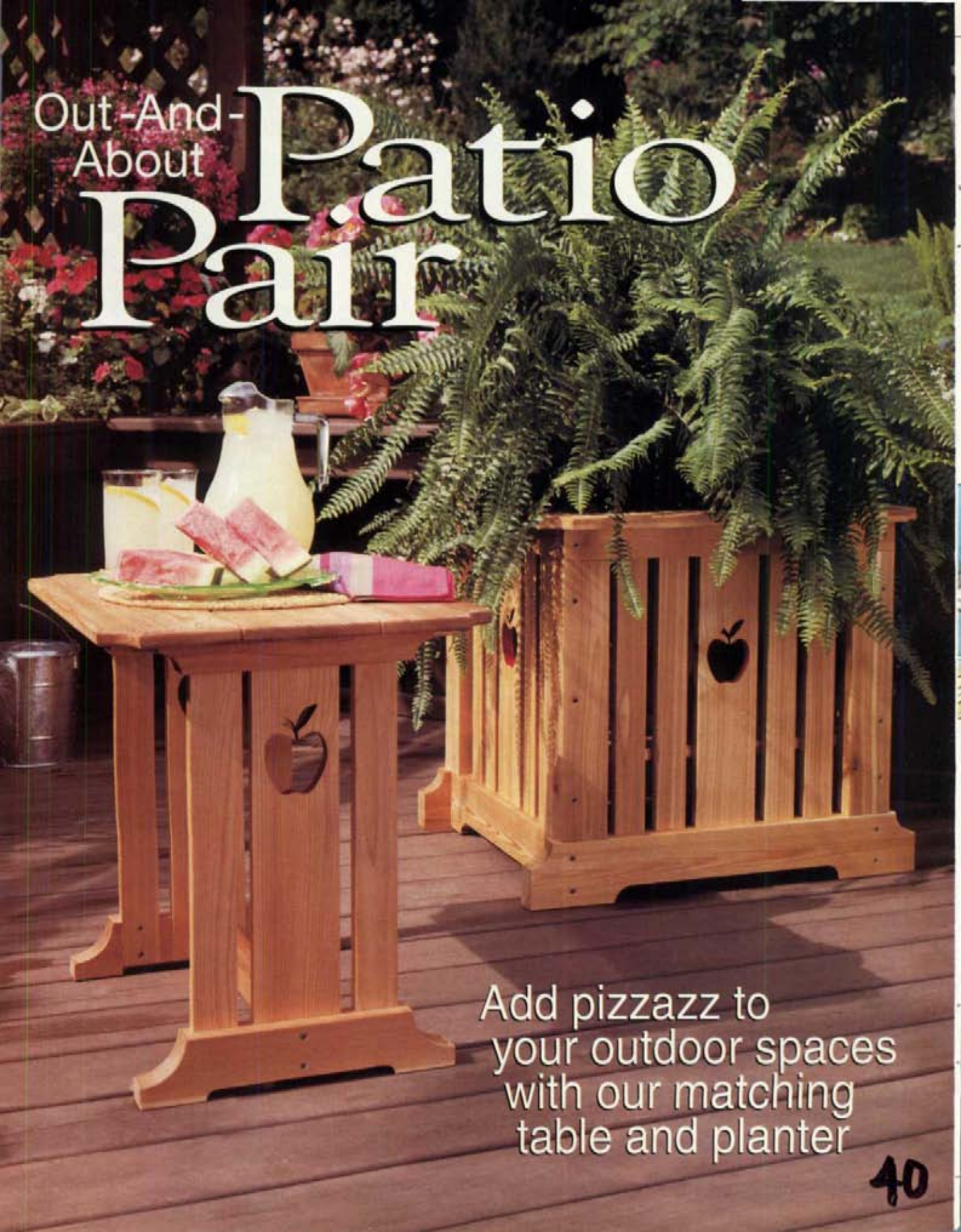
By the time you read this, Glomar bats will be taking a beating at pickup games on sandlots and anywhere else baseball is played. Juan has decided to run the retail bases against names such as Rawlings, Cooper, and Louisville Slugger. "We're going to have different models based on pro players' specifications, 22 in all," he says. "And even at $35 to $49 each, there won't be any drop-off in quality. Everyone has the right to swing a good bat."

Where to go for Glomar

To find a sporting goods dealer near you who handles Glomar bats, send a SASE to Glomar Enterprises, 116 W. Walnut Ave., Fullerton, CA 92632.

Written by Peter J. Stephano

Photographs: Ken Naverson; Ball park, Larry Clayton



Out-And-About Patio Pair

Add pizzazz to your outdoor spaces with our matching table and planter

PATIO CHAIR
April 1998 P. 42

PATIO TABLE
AND BENCHES
June 1996 P. 38

GLIDER
June 1995 P. 53

Complete your apple-motif patio furniture set with this handsome side table and planter. Using the same straightforward construction as the matching glider and chair from previous issues and shown *at left*, you'll have this pair assembled in plenty of time to enjoy the outdoors this summer.

PATIO PLANTER

Start with planter side and front frames

1 Cut the feet (A, B), top rails (C, D), uprights (E, F), and slats (G, H) to the sizes listed in the Bill of Materials (we used cedar).

2 Using the dimensions on the Parts View drawing on the *next page*, mark the dado locations on the feet (A, B) and top rails (C, D). Using the same drawing for reference, mark the radiused outlines on both feet. Using your tablesaw fitted with a dado blade and stop, cut the ¾"-deep dadoes on all eight pieces. Take your time when marking and cutting for correctly spaced dadoes.

3 Mark the locations, and cut mating half-lap joints across both ends of the uprights (E, F).

4 Transfer the full-sized apple pattern on *page 49* to the center slats (H), 10¼" from the top end of each where shown on the Frames drawing. Drill a blade-start hole, and scrollsaw the patterns to shape. Sand the edges of the cutouts.

5 Cut the bottom edges of the feet (A, B) to shape. Use a drum sander to sand the radii smooth.

6 Paint the apple cutouts in the center slats (H). To do this, brush the surfaces *around and inside* the apple cutouts with lacquer. The lacquer minimizes the wicking of the paint to the surrounding wood. Brush on red and green high-gloss exterior enamel paint. After the paint has dried, sand the lacquer off the surrounding surfaces.

Clamp the side frames between the two end frames, and drive screws to hold the assemblies together.

Assemble and connect the four frames

1 Glue and screw each of the four frames together in the configuration shown on the Frames drawing. When assembling each frame, keep the bottom ends of the slats (G, H) flush with the top of the cutout on the bottom side of the feet (A, B). Wipe off the excess glue with a damp cloth.

2 Clamp the side frames between the front and back frames. Drill countersunk mounting holes through the front and back frames and into the side frames where shown on the Exploded View drawing. Use a framing square to check for square and to locate the holes so they're centered in the uprights (F). Drive the screws.

Note: *The shelf allows you to raise or lower your potted plant for the best viewing height. In our planter, we positioned the shelf so the top of the pot was about level with the top of the planter.*

3 Cut the shelf cleats (I) and shelf boards (J) to size.

4 To locate the shelf for the planter, measure down from the top edge of the planter the height of your flower pot plus ¾", and

Continued

Patio Pair

make a mark on each side frame upright (F). Next, lay the planter on its side, position the top edge of one cleat (I) even with the marked lines on two of the uprights (F). Drill mounting holes and screw the cleat in place. Repeat for the second cleat on the opposite site of the planter. Then, screw the shelf boards (J) to the cleats, leaving ¾" between each board.

The top trim completes the construction

1 Cut the top trim boards (K) to size. Fit your tablesaw with a dado blade, and cut mating half-lap joints in each. See the Trim Board detail accompanying the Exploded View drawing for reference.

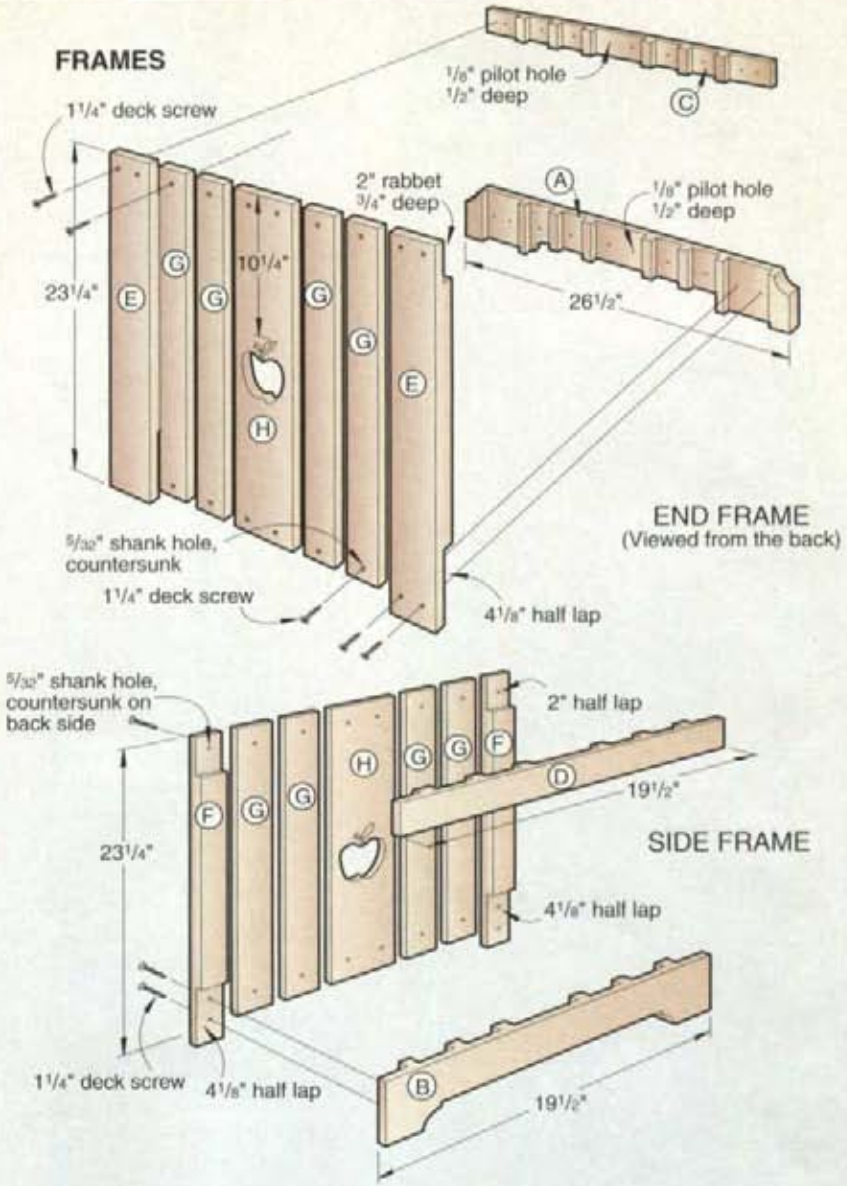
2 Glue and screw the trim boards together, checking for square. Mark a 1½" radius on each corner, and cut and drum-sand them to shape.

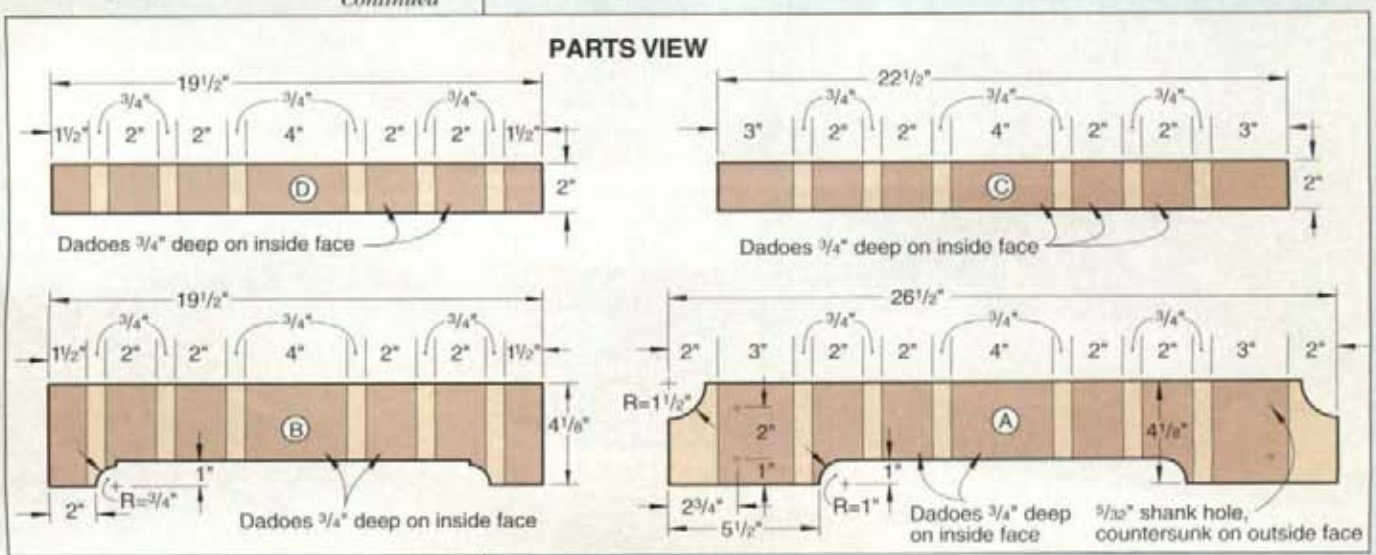
3 Rout a ⅛" round-over on all but the bottom inside edge of the trim-board frame where shown on the Exploded View drawing.

4 Center, then glue and screw the frame to the planter base.

5 Finish-sand the entire planter, and add a quality exterior finish. It's critical to get a good seal on the bottom of the feet (those parts that come in direct contact with the ground or patio). Recoat the chair annually.

Continued





CUTTING DIAGRAM

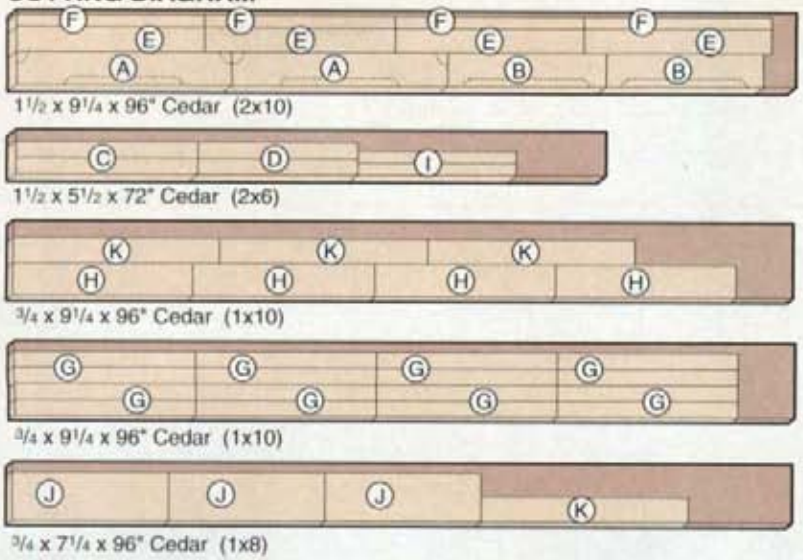
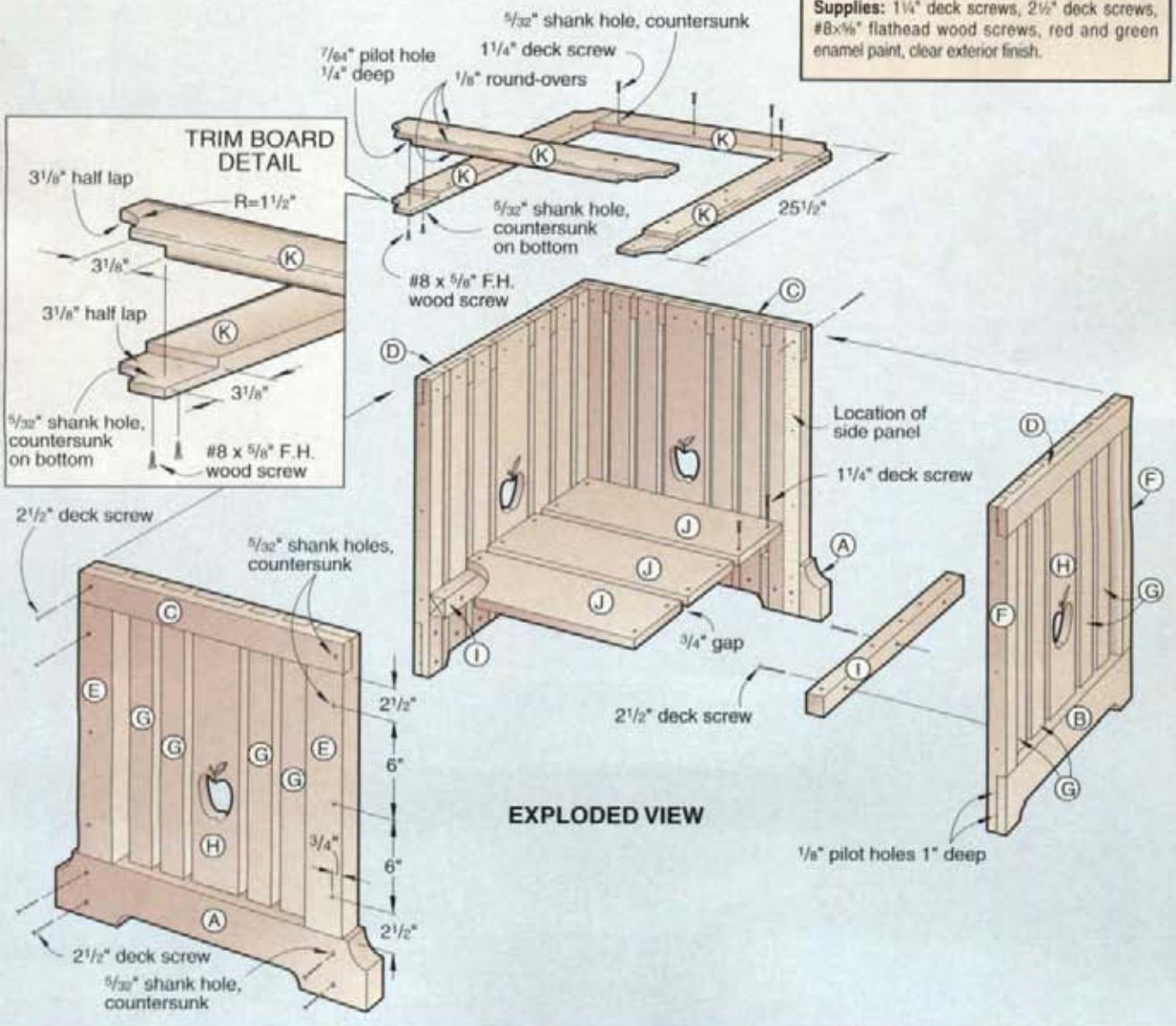

F E F E F E F E A A B B
1½ x 9¼ x 96" Cedar (2x10)
C D I
1½ x 5½ x 72" Cedar (2x6)
K K K H H H H
¾ x 9¼ x 96" Cedar (1x10)
G G G G G G
¾ x 9¼ x 96" Cedar (1x10)
J J J K
¾ x 7¼ x 96" Cedar (1x8)

TABLE
Bill of Materials

Part	Finished Size			Matl.	Qty.
	T	W	L		
A feet	1½"	4⅛"	26½"	C	2
B feet	1½"	4⅛"	19½"	C	2
C top rails	1½"	2"	22½"	C	2
D top rails	1½"	2"	19½"	C	2
E uprights	1½"	3"	23¼"	C	4
F uprights	1½"	1½"	23¼"	C	4
G slats	¾"	2"	22¼"	C	16
H slats	¾"	4"	22¼"	C	4
I cleats	1½"	1½"	19½"	C	2
J shelf boards	¾"	6"	19½"	C	3
K top trim	¾"	3⅛"	25½"	C	4

Material Key: C-cedar

Supplies: 1¼" deck screws, 2½" deck screws, #8x⅝" flathead wood screws, red and green enamel paint, clear exterior finish.



Patio Pair

CHAIR-SIDE TABLE

Using a construction procedure similar to that of the planter and chair, build the side table shown here. See the Parts View on the *opposite page* for parts A, B, and F. Also see the Bill of Materials *below* for part sizes. Finally, review the Cutting Diagram for laying out the pieces.

Clamp the top boards together using spacers for even gaps, then screw the base to the bottom of the top.

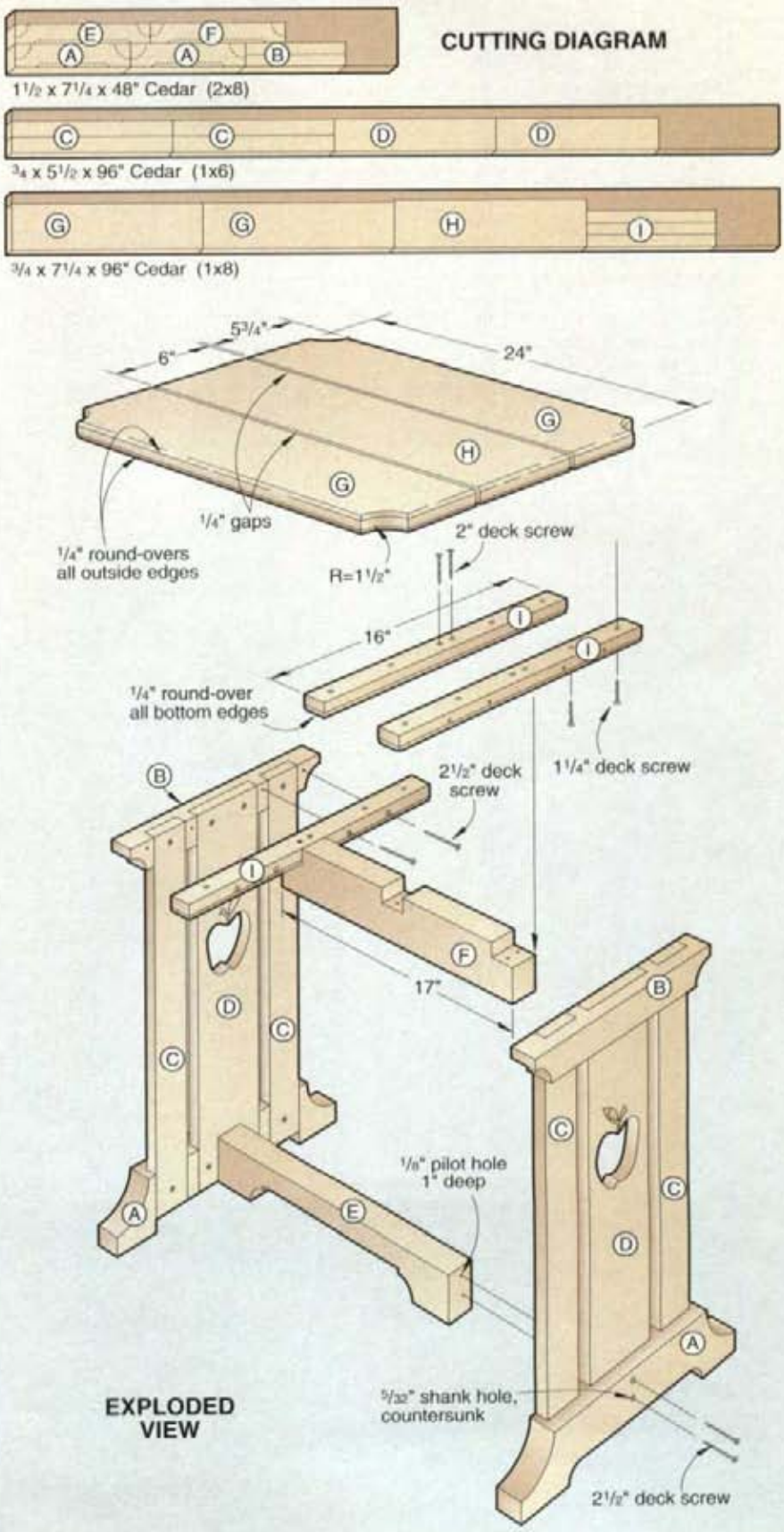
TABLE
Bill of Materials

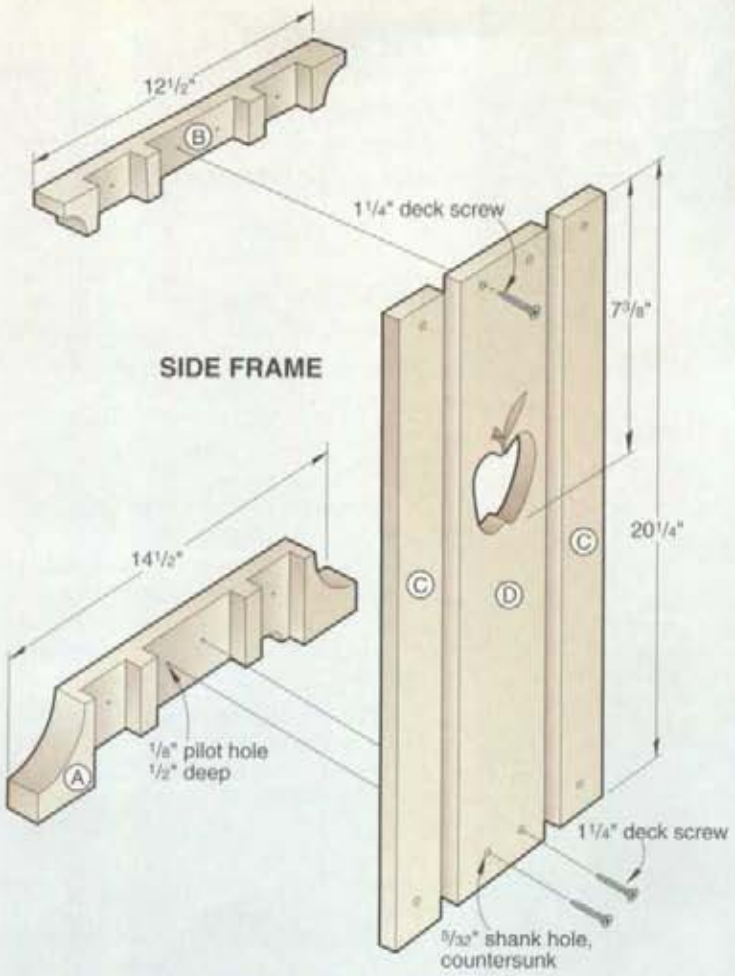
Part	Finished Size T	W	L	Matl.	Qty.
A feet	1½"	3"	14½"	C	2
B top rails	1½"	1½"	12½"	C	2
C slats	¾"	2"	20¼"	C	4
D slats	¾"	4"	20¼"	C	2
E lower crossmember	1½"	2½"	17"	C	1
F upper crossmember	1½"	2½"	17"	C	1
G top boards	¾"	5¾"	24"	C	2
H top center board	¾"	6"	24"	C	1
I cleats	¾"	1½"	16"	C	3

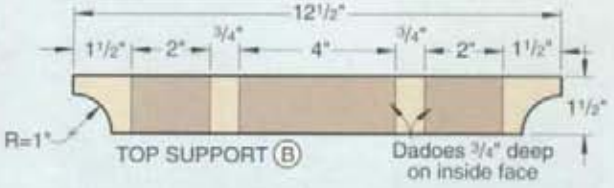
Material Key: C-cedar

Supplies: 1¼" deck screws, 2" deck screws, 2½" deck screws, red and green enamel paint, clear exterior finish.

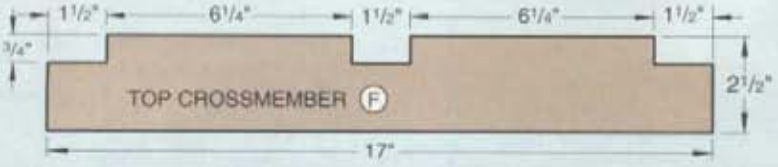
Written by Marlen Kemmet
Project Designs: Gary Webster
Illustrations: Roxanne LeMoine; Lorna Johnston
Photographs: Bill Hopkins

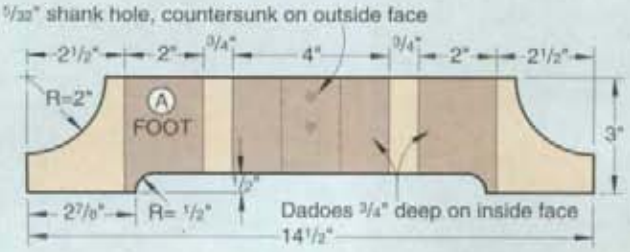


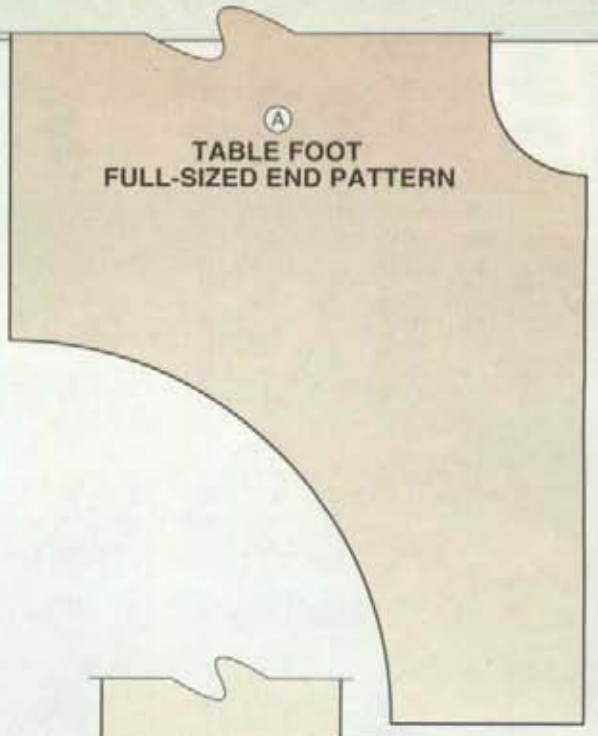


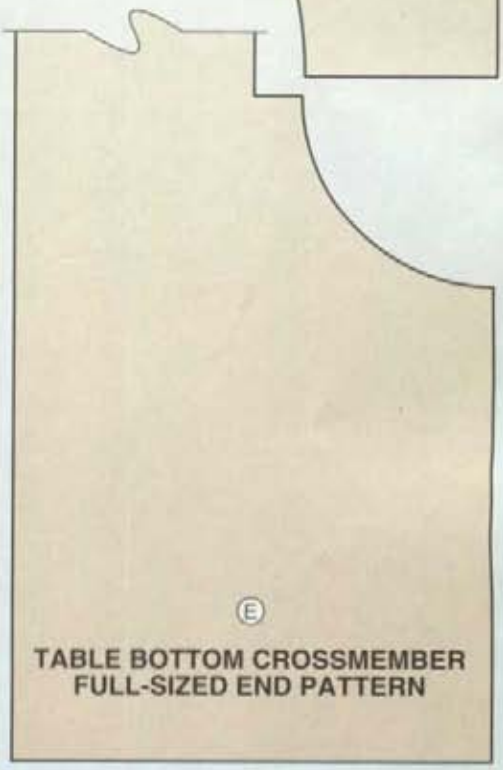


PARTS VIEW









To order our other plans

Our glider and patio table with benches were such successes we've put together a WOOD PLAN® of each so you can build these projects to create an entire set. Order the Glider, OFS-1028 or the Apple Patio Table and Benches, OFS-1038 from *WOOD* Magazine Plans, P.O. Box 9255-Dept. 9806, Des Moines, IA 50306. Or call 800/572-9350 to order. We also can accept orders electronically through our internet site at www.woodmagazine.com

Bathing Beauty

A birdbath that will make a big splash in your yard

Our apple-accented outdoor furniture has been a hit with readers. Here's a matching piece that birds will love—an easy-to-build birdbath.

Let's start sawing

1 Cut all parts to the sizes shown in the Bill of Materials. You can saw all of them from two pieces of western red cedar—a 2×4 and a 2×6, each 8' long. Cedar lumber is often knotty, so select boards that will allow you to avoid the worst of the knots.

2 Saw 30° bevels on both sides of one end of each bowl support (A) and foot (B). The bevels should meet at the middle of the end, as shown by the Top Section Top View drawing and the Exploded View drawing. To cut the bevels uniformly, tilt your tablesaw's blade 30° from vertical, then set up your miter gauge with an auxiliary fence. Position a stopblock on the auxiliary fence to cut each set of parts.

3 Bevel-rip each wide upright (C) along both sides of one edge. The bevels should meet at the middle of the edge. After sawing the bevels, sand or hand-plane a slight flat at the point, shown in the Wide Upright End View drawing. This will create space for excess glue to squeeze into at assembly time.

4 Saw spline slots in the wide uprights where shown in the Wide Upright End View drawing. To accomplish this, leave the saw blade tilted to 30°, and attach an auxiliary fence to your saw's fence. Adjust the fence position and the blade elevation to cut the spline slots as dimensioned. Then, saw the slots, standing the workpiece on its beveled edge as shown *opposite page, top photo.*

5 Lay out the end profiles on the bowl supports (A) and feet (B), following the radii and dimensions shown on the Parts View drawings. Bandsaw the pieces to shape, remaining slightly outside the layout lines. Then, sand to the lines.

6 Saw three ⅛×¾×18" splines for the center joint. For strength, cut them from plywood or hardboard.

To saw the spline slots in the wide uprights, saw blade is tilted 30° from vertical. Position the rip fence to locate the slot correctly.

Now, do some drilling

1 Lay out the hole centerlines on the edges of parts A and B, following the dimensions in the Parts View drawings. Draw the lines on the edges that will be counterbored.

2 At the center of the edge, bore a ¾" hole ⅜" deep at each centerline. We used a drill press and Forstner bit, and positioned a fence to center the bit on the edge.

3 After drilling the counterbores, change to a 5/16" bit, and drill through the center of the counterbores, as shown *below*. The fence you set for drilling the counterbores will help you drill the bolt holes accurately.

Next, add the apples

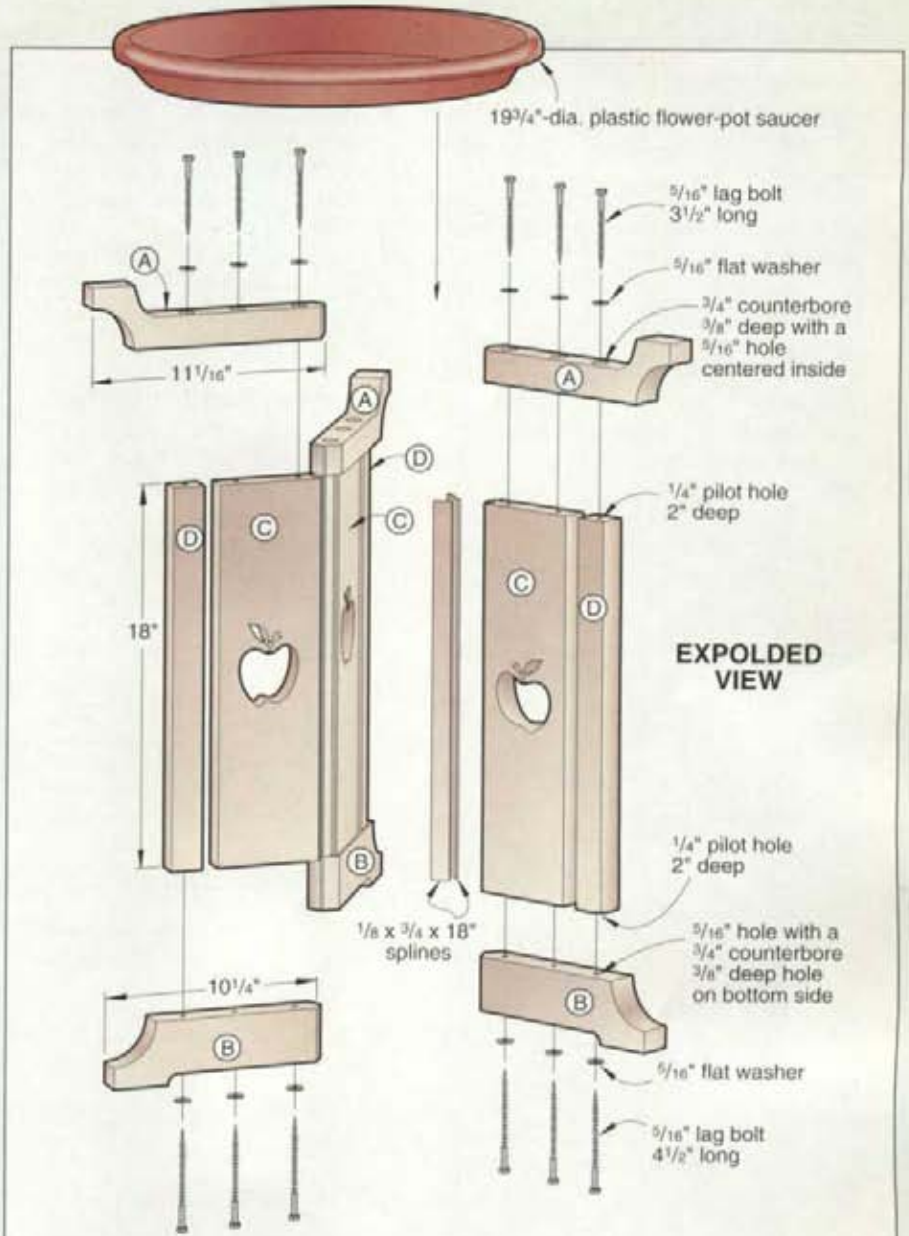
1 Make three copies of the Full-Size Patterns for the apple design. You'll find the pattern on *page 49*.

2 Apply a copy of the pattern to each wide upright where shown. Rubber cement or spray adhesive will hold it. (If you use spray adhesive, follow the manufacturer's instructions for temporary bonding.) Point the leaf away from the beveled edge of the upright.

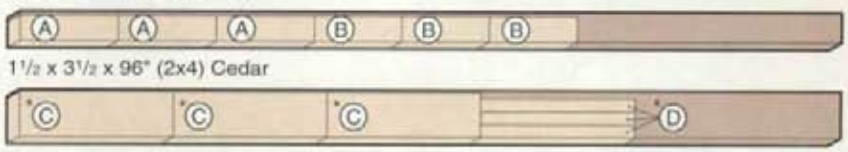
3 Drill a blade start hole inside the apple, and scrollsaw along the pattern

A fence on the drill-press table helps center the counterbores and bolt holes in the bowl supports and feet.

Continued


19¾"-dia. plastic flower-pot saucer
5/16" lag bolt 3½" long
5/16" flat washer
¾" counterbore ⅜" deep with a 5/16" hole centered inside
11 1/16"
¼" pilot hole 2" deep
18"
EXPOLDED VIEW
⅛ x ¾ x 18" splines
¼" pilot hole 2" deep
5/16" hole with a ¾" counterbore ⅜" deep hole on bottom side
10¼"
5/16" flat washer
5/16" lag bolt 4½" long

CUTTING DIAGRAM



*Plane or resaw to thickness listed in the Bill of Materials.

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
A bowl support	1½"	3"	11 1/16"	C	3
B foot	1½"	3"	10¼"	C	3
C wide upright	1¼"	5½"	18"	C	3
D thin upright	1¼"	1½"	18"	C	3

Material Key: C–western red cedar

Supplies: Woodworker's glue; 5/16x3½" and 5/16x4½" lag bolts; 5/16" flat washers; clear lacquer; red and green exterior enamel; clear exterior finish; silicone adhesive; 19¾"-dia. plastic flower-pot saucer (see Buying Guide).

Buying Guide

Birdbath bowl. Plas Terra saucer for 24" pot, clay or green color, $18.95 ppd. in U.S. Wild Birds Unlimited, 801 73rd St., Des Moines, IA 50312, 515/222-1234.

Bathing Beauty

line. A #7 blade, .045×.018" with 12 teeth per inch, works well for scrollsawing the thick cedar. Sand as necessary.

4 Paint the sawn apple edge red and the leaf and stem green. Here's how we did that.

First, brush clear lacquer onto the sawn edges and the surfaces around the apples, extending about 1" out from the cutout. The lacquer helps keep the paint from wicking into the wood grain, and masks the faces around the cutout for a tidier paint job.

After the lacquer dries, paint the leaf and stem green. Let that dry, then paint the apple red. To paint the cutouts, we sprayed small amounts of aerosol enamel into a paper cup, and brushed it on.

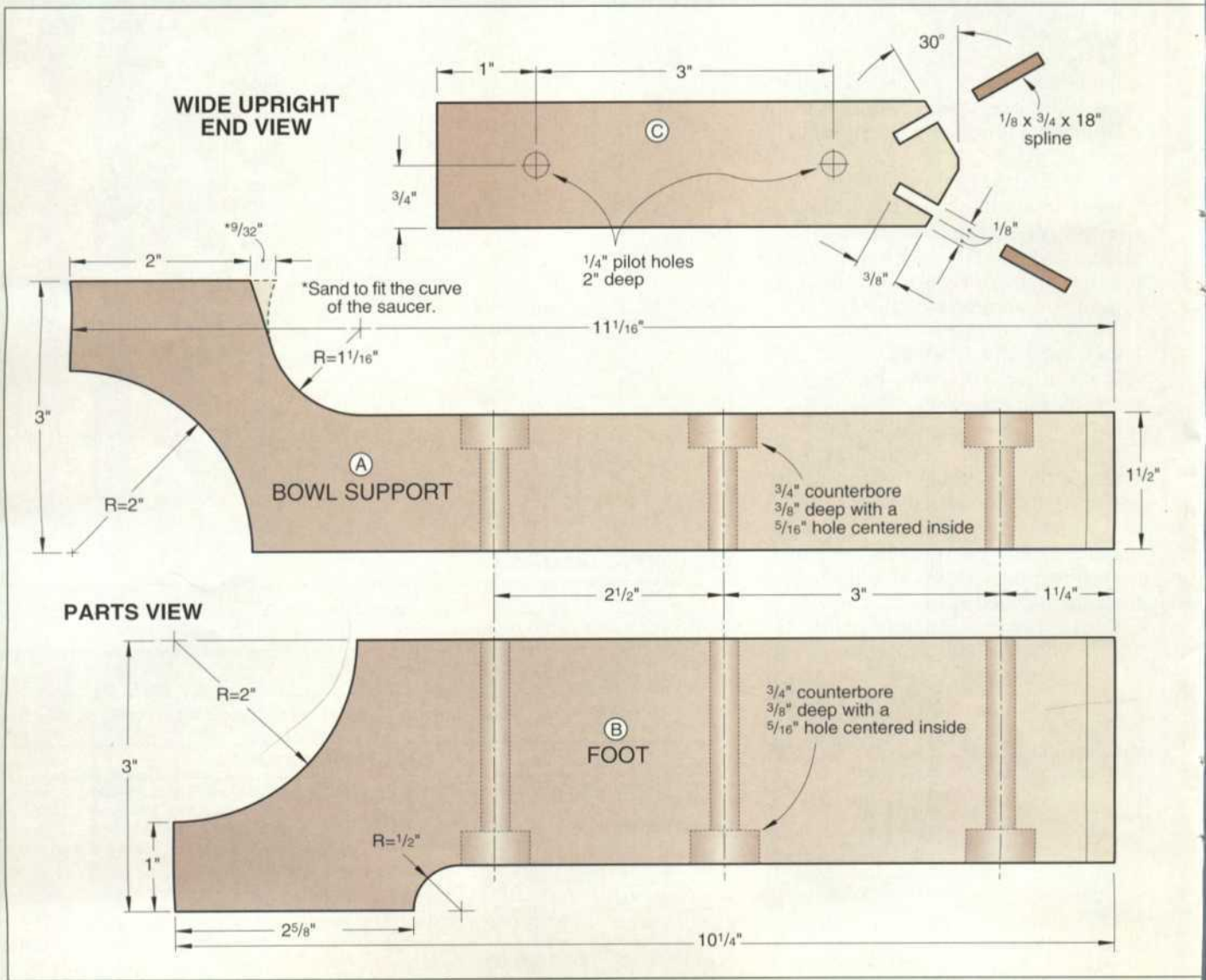
5 After the paint dries, sand the faces of the wide uprights to remove the lacquer.

6 Rout or sand ⅛" round-overs on all parts. Do not round over the ends of the upright members, C and D. Finish-sand all parts.

Put everything together

1 Dry-assemble the three wide uprights (C) and splines. To fit the parts together, insert a spline into the right-hand bevel of each part C. Then, bring the parts together at the bottom, and working upward,

Work from the bottom upward when assembling the splined three-way joint.



push the three-way joint together, as shown *opposite page*. Pull the joint firmly together with two band clamps to check the fit.

2 When you're satisfied that the parts fit together properly, undo the clamps, separate the parts, and reassemble with water-resistant glue (we used Titebond II). Clamp until dry.

3 Stand the assembled wide uprights on end, the top end up. Place the bowl supports on top of the assembly, centering each from side-to-side with their junction over the center of the upright assembly.

4 Hold the bowl supports in position, and mark the centers for pilot holes into the uprights. Inserting a pencil or one of the lag bolts through the holes in part A will mark the centers.

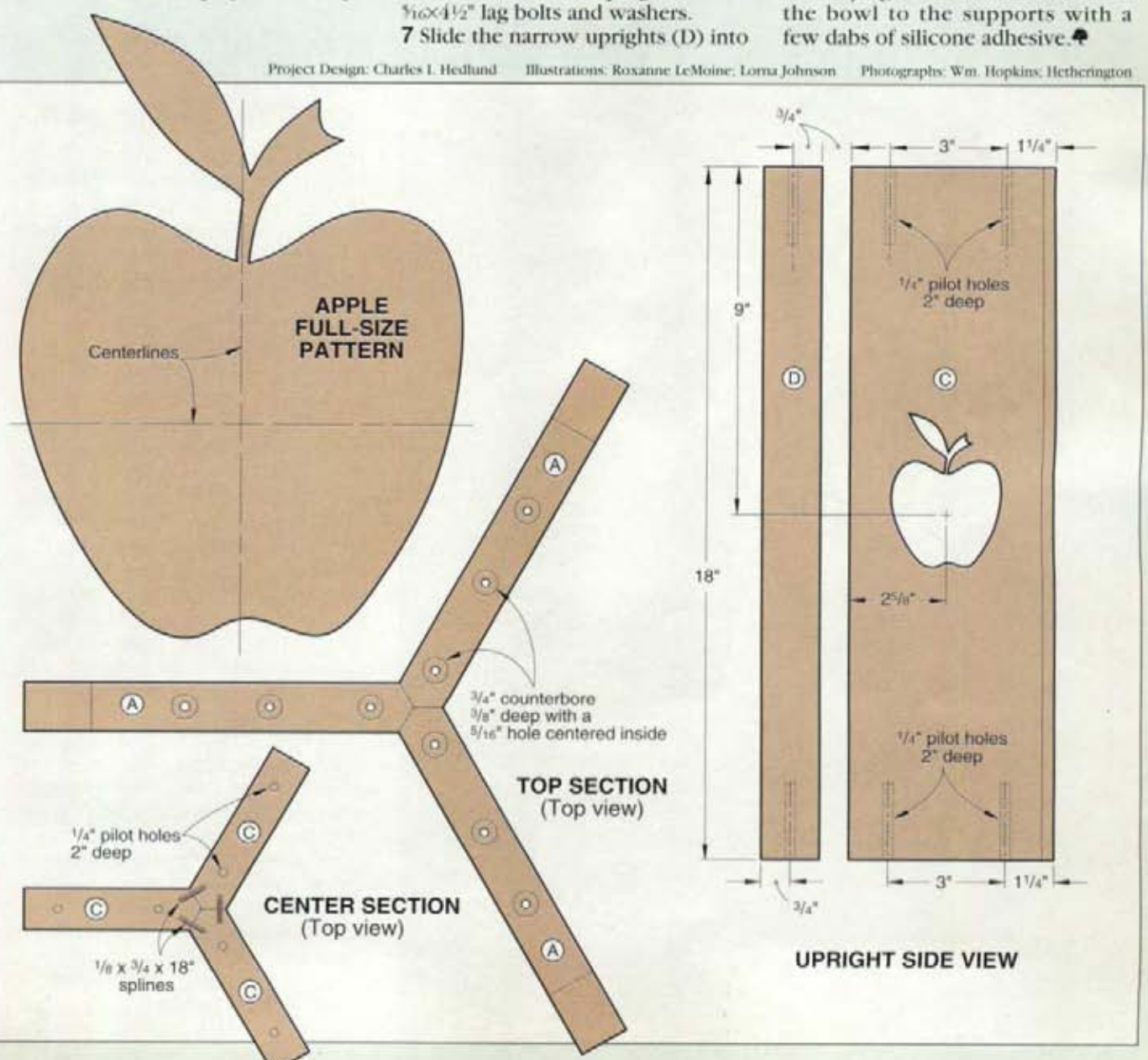
5 Drill ¼" pilot holes 2" deep. Attach the bowl supports to the wide uprights with 5/16×3½" lag bolts and washers. A socket wrench (½") makes driving the bolts into the counterbores easier.

6 Stand the assembly on its top, and drill pilot holes for the feet (B), following the same procedure. Attach the feet to the uprights with 5/16×4½" lag bolts and washers.

7 Slide the narrow uprights (D) into position, mark pilot hole centers in both ends, and drill the pilot holes. Bolt the uprights into place. Handscrew clamps will hold the narrow uprights while you drive in the bolts.

8 Apply a clear exterior finish. After it dries, place the tray in the bowl supports. We designed the birdbath for a 19¾"-diameter plastic flower pot saucer (Akro-Mils Plas Terra no. 12-424 saucer for a 24" pot.) You should be able to purchase one at a garden-supply shop, or you can mail-order one from our source in the Buying Guide. You can secure the bowl to the supports with a few dabs of silicone adhesive.

Project Design: Charles I. Hedlund Illustrations: Roxanne LeMoine; Lorna Johnson Photographs: Wm. Hopkins; Hetherington



High-Volume, Low-Pressure (HVLP) Sprayers

The truth behind the mist

When we decided to check out HVLP spray systems priced under $300, we knew exactly who to turn to. Auto body specialist and *WOOD*® magazine tool tester Bob McFarlin has been slinging spray guns for 20 years. So you're about to hear from someone who knows the difference between the must-have sprayers and the also-rans.

How HVLP sprayers differ from conventional sprayers

The key distinction between these systems lies in the amount of finish overspray each produces. Conventional guns blast out air at up to 40 pounds per square inch, compared to just 4 to 10 psi from an HVLP gun. This puts up to 85 percent of the finish from an HVLP gun on the project, compared to only 35 percent from conventional sprayers. You waste less finish, and you don't end up coating everything in your shop with overspray.

Professional-level HVLP systems evolved for two reasons, Bob tells us: Environmental considerations and skyrocketing material costs, especially for automotive color, which have risen from $15 to upwards of $80 per quart. For a production facility, reducing overspray cuts down on airborne solvents, and uses a lot less expensive paint in the bargain.

The cost of finishes isn't a big consideration for most amateur woodworkers, but low-cost HVLP systems—scaled-down versions of the professional equipment Bob uses every day—take much of the mess out of spraying in a home shop. They also lay on a smoother finish than you can create with a brush. The chart on the *next page* shows how HVLP systems stack up against other finishing options.

Fast facts

- Most HVLP sprayers offer one key advantage to home woodworkers: less overspray. They don't pollute your shop's environment, or leave a settling of finish on shop surfaces, to the extent that conventional sprayers do.
- Some conversion sprayers labeled as HVLP systems actually create as much overspray as conventional sprayers. We'll tell you which ones do this and how to spot such imposters.
- The under-$300 HVLP systems we tested for this article do not atomize finishes well enough to meet the exacting needs of spraying high-gloss, super-smooth surfaces such as car exteriors. But, they do an excellent job of applying finishes to wood.
- It's a real chore to clean the finish from these guns, just as it is with conventional guns. So, only consider a spray gun if the amount of finishing you do justifies the cleanup hassle.

HOW HVLP SPRAYERS COMPARE TO OTHER FINISHING OPTIONS

FINISHING OPTION	QUALITY OF FINISHED SURFACE USING A HIGH-VISCOSITY FINISH (1)	QUALITY OF FINISHED SURFACE USING A LOW-VISCOSITY FINISH (2)	EASE AND SPEED OF APPLICATION	AMOUNT OF OVERSPRAY	CLEANUP CONVENIENCE	INITIAL COST	LONG-TERM COST
HVLP TURBINE SPRAYER	G	E	E	G	P	HIGH	LOW
HVLP CONVERSION SPRAYER	G	E	E	G	P	HIGH	LOW
CONVENTIONAL SPRAY GUN	F	E	F	P	P	MEDIUM	LOW
AEROSOL SPRAY CAN	G	E	E	F	E	LOW	HIGH
BRISTLE BRUSH	F	F	P	E	G	LOW	MEDIUM

NOTES:
1. "Thick" finishes such as polyurethanes, water-based clears, enamel, and latex paints reduced no more than 10 percent with solvent.
2. "Thin" finishes such as lacquer reduced up to 50 percent with solvent.

E Excellent G Good F Fair P Poor

Atomization: the secret to smooth finishes

Although HVLP spray systems greatly reduce overspray, there's no such thing as no overspray, Bob emphasizes. Why? The operative word with any sprayer is atomization, which uses air to break the finish into tiny droplets.

Conventional guns atomize the finish into a very fine, vapor-like mist that clouds the air. HVLP sprayers atomize the finish into bigger droplets ranging from the diameter of a pin's body to the size of its head. The photo *below* shows the difference in the size of finish droplets from conventional and HVLP guns.

Though HVLP guns produce little airborne vapor, they still leave splatter around the project you're spraying. And even with HVLP equipment, overspray varies with the finish you're using and the size of the project. The thinner the finish and the larger the project, the more overspray you'll generate.

We made one spraying pass on a black and white test surface with three spraying systems to show how well each of them atomizes finishes. HVLP guns do not atomize finishes well enough for auto painting, but they're plenty good for wood surfaces.

HVLP sprayers feature two ways to get air to the gun

HVLP sprayers differ in the way they deliver both air and finish to the nozzle. For this article we tested two types of units. Turbine-based machines pump their own air; conversion-air systems (CAS) tap air from a compressor. Here's a look at each.

- **Turbine sprayers** pump high volumes of air (50 to 60 cubic feet per minute) at just 4 to 5 pounds per square inch. They have no air tank and run continually, with no pressure regulator or moisture traps to impede air flow.

Turbines, like the one on *page 53*, include one or more direct-drive blowers that push air through a ¾"-inside-diameter hose. We tested three turbine sprayers, two from Campbell Hausfeld and one from Wagner. The Campbell Hausfeld HV2000 and the Wagner CS2000 FineCoat have plastic housings with

Continued

built-in paint gun receptacles. Both are lightweight with handles that make them easy to carry around. The Campbell Hausfeld HV2500 has a well-constructed metal case with internal baffling to lower the noise level, plus an exhaust filter that also lowers noise.

At 95 decibels, the HV2000 sounds like a shop vacuum. The HV2500 and the Wagner are much quieter at 85db. (Decibel levels double every 10db; you can talk over 85dbs, but not 95.)

Both of the Campbell Hausfeld units are equipped with fine foam filters. The Wagner's filter is also foam, but it's much coarser. This helps maintain CFM, but doesn't do a good job of trapping fine dust.

•**Conversion sprayers** look like conventional spray guns. Both use a compressor and air tank as an air source. But, HVLP conversion guns have large orifices at the gun's business end as shown *right*. These holes, as well as other internal components, let more air through. The result: a high volume of air at low pressure exits the gun in order to reduce overspray.

Of the conversion guns we tested, the Central Pneumatic 7901 does the best job of bringing HVLP technology to the woodworker. Bob says it doesn't atomize paint well enough for automotive use, but works well for finishing wood.

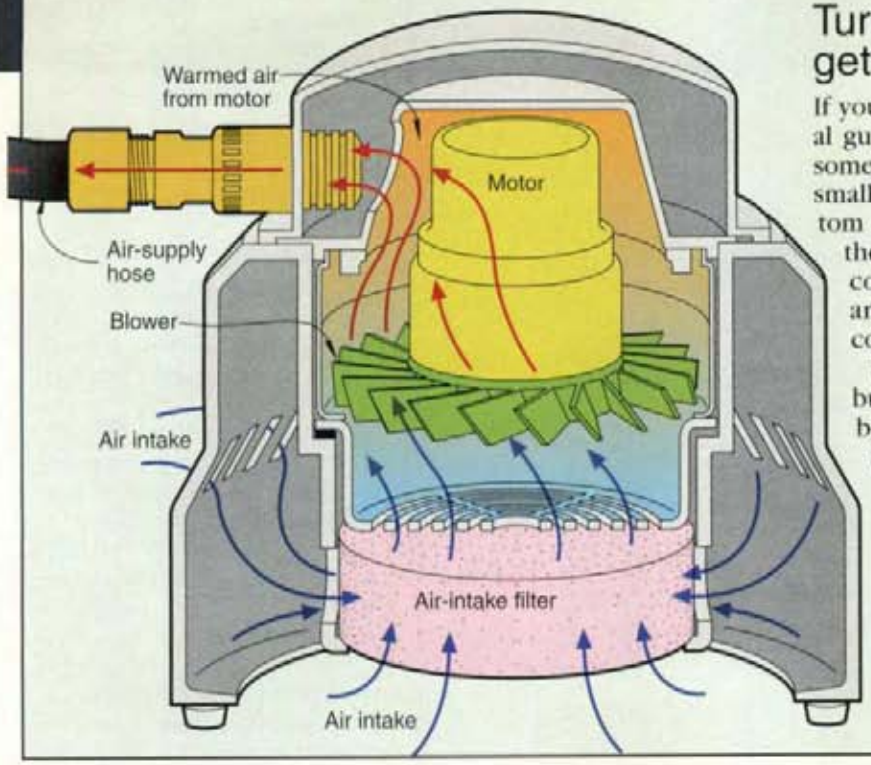
One problem with conversion systems: Most quickly exhaust the air pressure from a 3 hp compressor. In our tests, the conversion guns quickly ran the air tank down after about two minutes of spraying. With the Campbell Hausfeld PH8110 Bob had to stop spraying and let the compressor recover. All the other guns—except the Central Pneumatic 7901—continued to function, but orange peel increased and the spray width decreased.

Bob believes the Central Pneumatic 7901 is the only conversion gun that operates well from a 3 hp compressor. The others work better with a more-expensive 5 hp compressor.

If you decide to go with a conversion system, be sure to use hose couplers designed for high air flow. As shown in the *bottom* photo, these couplers have larger inside diameters than standard couplers. So, with them a conversion gun gets the high volume of air it needs to operate efficiently. We especially liked the Dynabrade no. 95674 coupler and no. 95677 female plug. For the name of a Dynabrade dealer near you call 800/828-7333.

You can tell a true HVLP gun from a conventional sprayer because, like the model on the right, it has large air orifices in the nozzle.

Conversion guns require high-air-flow couplers like those left (from Dynabrade) and middle (DeVilbiss). On the right is a standard coupler. Note the larger inside diameter of the male component of the high-air-flow couplers.



Turbines take some getting used to

If you're used to spraying with a conventional gun, you may find a turbine gun cumbersome at first. With a conventional sprayer, a small-diameter air hose attaches to the bottom of the gun and you control airflow with the trigger. Turbines run off larger hoses connected to the back of the gun body, and have constant airflow. The trigger controls the finish, but not the air.

Bob found the turbine guns and hoses bulkier than the ones he uses every day, but with a slightly different wrist pressure he quickly learned to control them.

And, unlike a compressed-air system, air gushes out of a turbine-powered gun even when you let go of the finish-application trigger (while the turbine is switched on). So, you have to be careful about turning the unit on around dust. The best procedure, Bob advises, is to hook up the gun and be ready to spray before hitting the on/off switch.

The big shoot-out: How the sprayers performed

To put the HVLP equipment through its paces, Bob sprayed seven different wood finishes including four oil-based products: polyurethane, lacquer, enamel paint, and stain. He also sprayed three water-based products: clear finish, stain, and latex paint. Each was first sprayed unreduced, then thinned, if necessary, until the finish atomized without sacrificing coverage or durability.

Bob first sprayed oak, pine, and maple test panels, but differences in the woods' grains and porosities made it difficult to gauge finish quality. For a more objective test, he then sprayed each finish onto Sherwin-Williams test cards—treated paper that's half black, half white. With this consistent base, Bob was able to accurately evaluate orange peel and atomization. He paid special attention to overspray—both in the air and bouncing off the surface.

Here are some general observations of what happened with each of the finishes. See the chart on *page* 55 for how well each of the tested guns did with each finish.

- **Polyurethane.** To get this finish to flow through the guns we had to reduce it 20 percent with solvent. (Thinning also helps the finish droplets "flow" into a consistent film after they strike the project surface.) Only four guns produced good results with this finish.
- **Lacquer.** Reduced 100 percent with thinner, lacquer atomized finer than any other finish. All of the tested guns sprayed lacquer glassy smooth.
- **Water-based stain.** Water-based finishes proved more difficult to atomize than solvent-thinned materials, mainly because water is harder to break into fine particles without high pressure. None of the turbines did an excellent job, but the Campbell Hausfeld 2500 did better than the other tested units. The higher-pressure Central Pneumatic 7901 gave excellent results with minimal overspray.
- **Oil-based stains.** These atomized much better than water-thinned materials and all the HVLP guns performed well. (However, Bob notes that unless he had an extremely large project or a production situation, he wouldn't bother spraying stain. It's not difficult to apply by hand, and he didn't think the results of spraying justified the hassle of cleaning the gun.)
- **Water-based clear finish.** Manufacturers don't recommend thinning water-based finishes, but out of the can, their thick viscosities made them all but impossible to spray. Thinning with one part water to six parts finish brought acceptable results. As with water-based stains, the CAS systems performed better than the turbines.
- **Enamel.** Here's an area where the HVLP sprayers performed quite well. They let the average woodworker spray enamel finishes with near-professional results.
- **Latex.** The turbines scored highest with latex. Thinned with one part water to five parts paint, they sprayed better than the conversion systems because they sprayed a higher volume of paint. Both the suction- and gravity-feed guns had trouble moving the material. With these, pressure needed to be turned up to 40 PSI, which greatly increased overspray.

Continued

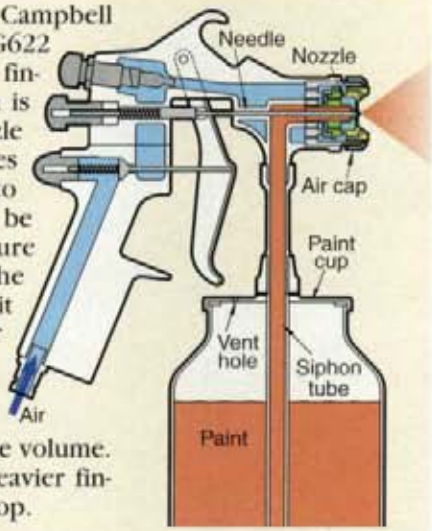
HVLP Sprayers

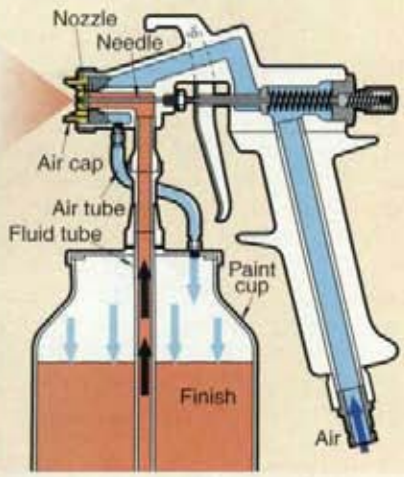
From pot to nozzle: three ways to move the finish

HVLP sprayers move finish from the "pot" or cup to the nozzle in three different ways. Here's how they compare.

•**Suction-feed** guns, such as the Campbell Hausfeld PH8110 and DeVilbiss FLG622 we tested, create suction that pulls finish up a siphon tube. The suction is created by air moving past the nozzle at high speed. The PH8110 requires 30 to 40 pounds per square inch to operate and could more accurately be called a high-volume, high-pressure system. Not surprisingly, it was the worst oversprayer in our test, and it also had trouble pulling up heavier finishes such as enamel and latex.

The DeVilbiss FLG622 uses newer HVLP technology that drops the pressure and increases the volume. It did a good job with even the heavier finishes, but overspray clouded the shop.





•**Pressure-feed guns**, from Campbell Hausfeld, Central Pneumatic, and Wagner, use air pressure to force finish up the siphon tube at 10 PSI or less. A small hose channels air from the gun body's air chamber into the pot.

Overfilling a pressure-feed gun and tipping it horizontally can leak finish into the air hose, creating a major cleaning headache. To prevent this, Bob recommends filling pressurized cups only ¾ full, or spraying all vertical surfaces first to lower the finish level before you tip the gun.

•**Gravity-feed guns** from Central Pneumatic and DeVilbiss have cups mounted on the top of the gun— gravity feeds the finish. Both gravity-feed and pressure-feed guns handle heavy finishes (properly reduced) with ease. The gravity-feed guns oversprayed less than the suction-feed sprayers, but more than the pressure-feed guns.

What you need to know about needles and nozzles

A small hole in the center of the fluid nozzle restricts the flow of thick finishes, and a large hole allows thick (high viscosity) finish through. This means you need to tailor the needle and nozzle assembly to the material you're spraying. Lacquer requires a fine needle and nozzle; thicker finishes spray best through a medium to large tip set.

The Campbell Hausfeld turbines come with a fine and medium set, and you can buy a set for thick materials. The Wagner is equipped with a medium needle and nozzle, and four other sizes are available.

DeVilbiss guns have just one needle that works with two sizes of nozzles, which are included with the guns. The other conversion guns need only one needle/nozzle set because you can vary the air pressure to properly atomize finishes with different viscosities.

Bob's picks

If you own a 3 hp-or-larger compressor, consider the Central Pneumatic 7901. It did the best job of limiting overspray while acceptably atomizing the finishes. Bob really likes the way this gun sprayed the materials he tested it with.

If you want outstandingly fine atomization, can put up with more overspray, and have a 5 hp compressor, buy the DeVilbliss FLG631 gravity gun.

For woodworkers without a compressor, we like the Campbell Hausfeld HV2500. It's well-constructed, quiet, and showed good results with most finishes. The Wagner FineCoat CS2000 came in a close second. The Campbell Hausfeld HV2000 also sprays well, if you can put up with the racket it makes.

THE ABC'S OF HVLP

BRAND	MODEL	AIR SOURCE (1)	GUN TYPE (2)	GUN MATERIAL (3)	CUP MATERIAL (3)	AIR CAP MATERIAL (3)	FLUID CAP MATERIAL (3)	HOSE LENGTH (FEET)	QUALITY OF VARIOUS SPRAYED FINISHES (4)							CLEANUP (4)	OVERSPRAY (4)	WARRANTY (MONTHS)	COUNTRY OF ASSEMBLY (8)	SELLING PRICE (9)
									POLYURETHANE (5)	LACQUER (6)	WATER-BASED CLEAR FINISH	WATER-BASED STAIN	OIL-BASED STAIN	ENAMEL PAINT (7)	LATEX PAINT (7)					
CAMPBELL HAUSFELD	HV2000	T	P	P	A	S	SS	15	G	E	F	F	G	G	G	F	E	12	U	$200
	HV2500	T	P	P	A	S	SS	25	G	E	F	G	G	G	G	F	E	12	U	300
	PH8110	A	S	A	A	A	SS	*	P	E	G	F	G	P	P	G	P	36	U	160
CENTRAL PNEUMATIC	5726	A	P	A	A	A	SS	*	F	E	F	F	F	G	F	F	G	1	T	70
	7901	A	P	A	A	A	SS	*	G	E	G	E	G	E	F	F	E	1	T	80
	34944	A	G	A	P	B	SS	*	F	E	E	E	E	E	F	G	F	1	T	80
DEVILBISS FINISH LINE	FLG 622	A	S	A	A	A	P	*	P	E	E	G	E	G	F	F	P	12	E	175
	FLG 631	A	G	A	P	A	P	*	F	E	E	G	E	E	G	G	F	12	E	170
WAGNER	CS2000 FineCoat	T	P	A	A	A	SS	15	G	E	F	F	G	G	G	F	E	12	U	290

NOTES:

1. (T) Turbine
   (A) Air compressor
2. (G) Gravity-feed
   (P) Pressure-feed
   (S) Suction-feed
3. (A) Aluminum (B) Brass
   (P) Plastic (S) Steel
   (SS) Stainless steel
   (*) Hoses not included with these guns. We suggest you use a 25'-long compressed-air hose.
4. E Excellent
   G Good
   F Fair
   P Poor
5. Reduced 5 parts of polyurethane to 1 part of solvent.
6. Reduced 1 to 1.
7. Reduced 5 to 1.
8. (E) England
   (T) Taiwan
   (U) United States
9. Selling price based on catalog prices at time of article's production.

Where to call for more information:

Campbell Hausfeld 800/626-4401

DeVilbiss Finish Line 800/433-8997

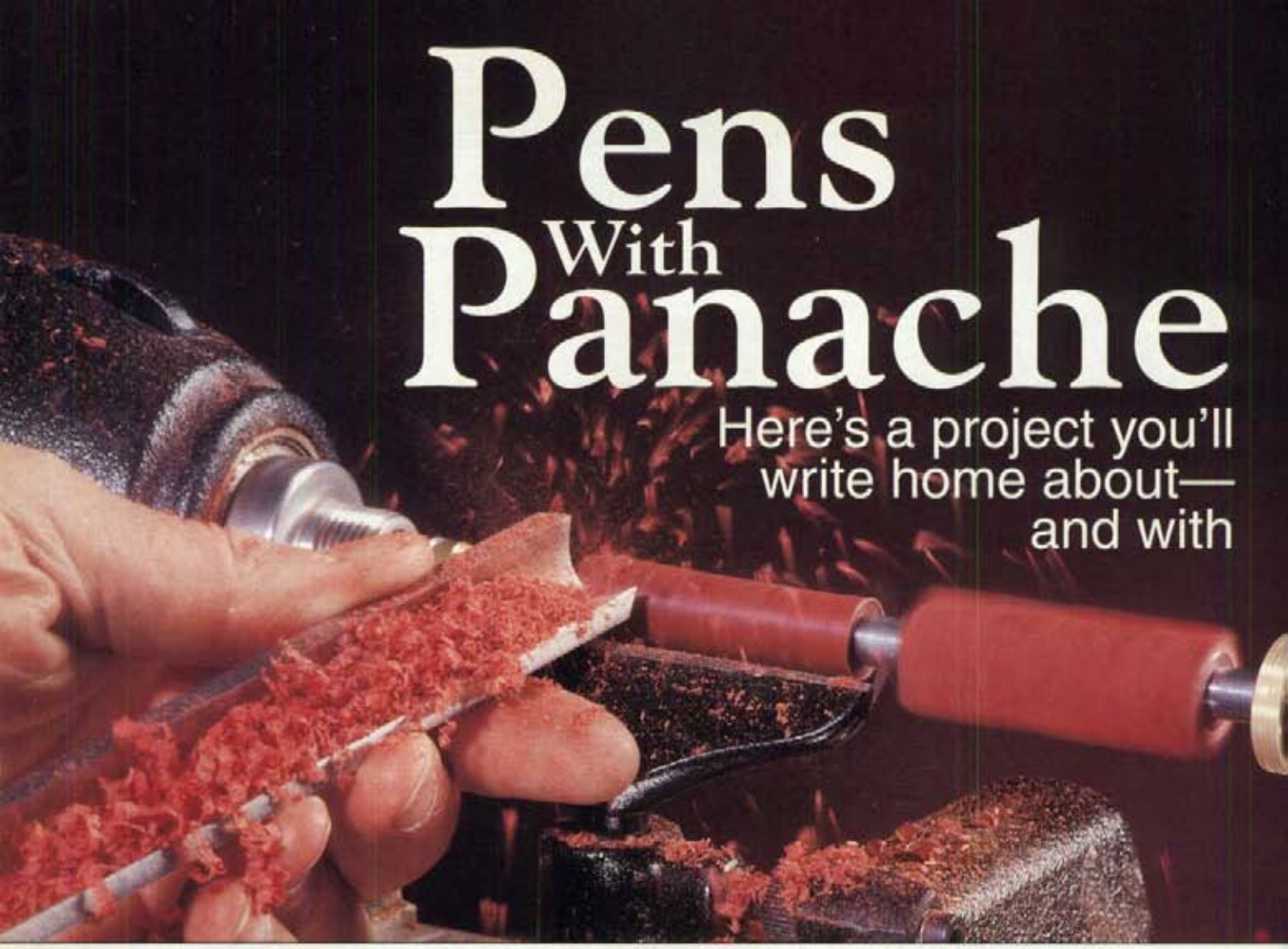
Central Pneumatic (Harbor Freight) 800/423-2567

Wagner 800/292-4637

Written by Jim Hufnagel Technical consultant: Bob McFarlin Photographs: Hopkins Associates Illustrations: Kim Downing

Pens With Panache

Here's a project you'll write home about—and with



Whether you're just looking for a little fun at the lathe, want to make some gifts, or hope to start a sideline business, think pens and pencils. We asked professional woodturner and penmaker Rus Hurt for some tips on turning fine writing instruments. Here's what we learned.

Here are the tools and equipment you'll need

Basic equipment includes a *lathe* and a *drill press*. A *tablesaw* or *bandsaw* comes in handy if you want to saw your own blanks.

Almost any lathe will do. Many penmakers prefer a mini lathe, such as the Carba-Tec shown (from Penn State Industries, 800/377-7297), or a special pen-turning lathe for the job. But you can turn pens on full-size machines, too. The lathe should run up to 2,000–3,000 rpm, but you probably won't need to run it slower than 1,000 rpm, even for roughing out the small turnings.

The key to turning the two wooden parts of a pen or pencil, as well as a variety of similarly made items, is a *mandrel* that runs between centers on your lathe. Some mandrels are designed to be gripped in a drill chuck installed on the lathe's headstock, but Rus likes the Morse-taper type that fits right into the headstock spindle. A live tail center supports the other end.

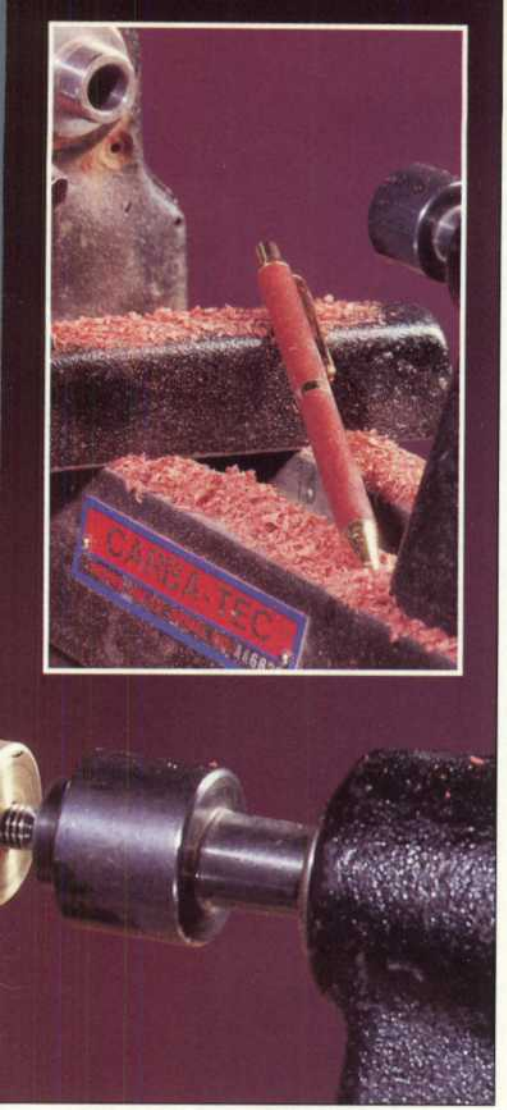
In addition to the mandrel, you'll need *bushings* for the particular style of pen you're turning. These sizing bushings, sold in sets, slide onto the mandrel to help you establish the correct diameter for the turnings. Many woodturning suppliers sell mandrels and bushings; the ones shown, along with other necessities, came from Craft Supplies USA. See the Buying Guide on *page 59* for the address.

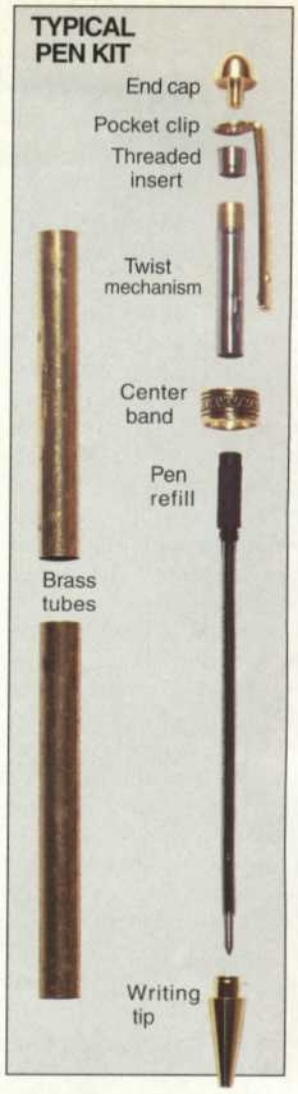
A *barrel trimmer* comes in handy for squaring the ends of the blanks prior to turning. And some pen styles require a *cap adjuster tool*. (Your pen-parts supplier can tell you whether the style you're buying requires this special tool.)

As for turning tools, Rus relies on a ⅜" spindle gouge, a ½" skew, a ⅛" parting tool, and sometimes a 1/16" parting tool for his pen work.

Wood is but one of the materials you can use

For each pen or pencil, you'll need a parts kit like the one shown on the *opposite page*. These come in a variety of styles, priced from around $5–$20 each. Pen kits are





widely available; see the Buying Guide for our source.

And, of course, you'll need some wood, most commonly a blank measuring ¾×¾×5¼" for each pen or pencil. (You can make some styles from smaller stock.) This is a great opportunity to use up little odds and ends of exotic woods, burls, highly figured stock, or found woods. Before turning, you'll drill lengthwise through the blank and glue a brass tube (furnished with the pen or pencil kit) inside. This allows you to use stock that might otherwise be too fragile for a thin-wall turning.

You can try out other materials, too. Manufactured wood products (Dymondwood, Colorwood, acrylic-stabilized burls, and similar products) or plastics (some are manufactured specially for fancy pens) are great choices. You can even use bone and antler.

Prepare a pair of blanks

1 Cut the pen blank into two parts, the correct lengths. (The straight-bodied pencil we turned for the photographs called for two 2"-long blanks.) Lengths may differ for other pen styles—check your kit instructions. Take care to cut the ends squarely.

2 Locate the center on one end of each piece, then, with a drill press, drill lengthwise through the center of each part. The kit you're using will specify the correct bit size.

Though it sounds simple, drilling the blanks can be the most troublesome part of the job. Here are some tips to minimize the possibility of spoiling a blank:

- Drill with a sharp bullet-point bit. Rus says that these pilot-tip bits from Black and Decker give the best results—they're less likely to wander or blow out the end of the blank. Pen instructions sometimes call for metric-size or letter-size holes. It's best to use the specified bit, but you may be able to get by with the fractional-inch bits nearest those sizes: 7mm–$^{9}/_{32}$"; 8mm and O–$^{5}/_{16}$"; and 10mm–$^{25}/_{64}$".
- Drill in a series of short bursts, withdrawing the bit frequently to clear chips. In exotic hardwoods and other dense materials, Rus drills about ⅝" deep in $^{1}/_{16}$" strokes, then lets the bit cool before continuing. Overheating the material during drilling, he says, can lead to cracking later, especially in plastics and plastic-stabilized wood.
- Hold the blank securely. A jig like the one shown on the *next page* does a great job of keeping the blanks vertical and steady, or you can clamp them to the drill-press fence. (See the Buying Guide for our source for the drilling jig.)

3 Glue the brass tube into the drilled blank. Epoxy or instant glue

Continued

(cyanoacrylate adhesive) will do; Rus prefers a polyurethane adhesive, such as Excel.

Roughen the outside of the tube with 150-grit sandpaper. If you're using polyurethane glue, moisten the hole in the blank with a damp rag or cotton swab. (Dampening the blank—especially a plastic one—helps the water-reactive glue cure quickly, Rus explains.)

Apply glue to the outside of the tube and the inside of the blank hole. Press the tube about halfway into the blank, rotating both parts to distribute the glue. Then, pull it out and reinsert it into the other end of the blank, making it flush on both ends. As the glue expands to fill voids, it may move the tube out of the blank; reposition the tube before the glue cures.

4 Trim the ends of the blanks with a barrel trimmer as shown *above right*. This will square the blank ends with the axis of the tube, ensuring that all parts fit well when you assemble the pen.

Now, grab your gouge

1 Slide the blanks and correct sizing bushings onto your mandrel assembly. Tighten the nut on the end to hold everything on the mandrel, as shown *opposite page, top*. For some pen styles, the blanks and bushings go in a particular order; check the pen instructions.

2 Fit the tapered end of the mandrel into the lathe spindle.

3 Slide up the tailstock with a rotating center installed, and engage the center's point in the depression in the end of the mandrel.

4 Turn the blank to a cylinder of the size established by the bushings, employing ordinary spindle-turning techniques.

You can use almost any spindle-turning tools—we roughed out the cylinders with a ¾" roughing gouge, as shown in the *opening photo*. Rus shapes pen barrels and caps with a ⅜" gouge, and wields a ½" skew for finishing cuts. He brings ⅛" or 1/16" parting tools into play for detailing on some pen designs. Run your lathe at a high speed (2,000–3,000 rpm) for finishing cuts, and always keep your tools sharp to ensure clean cuts on the small pieces.

You don't need to precisely center the hole on the end of the blank, but it must run straight and true through the blank.

The barrel trimmer pilots in the brass tube to square the ends of the blank to the tube.

5 Test the turned barrel and cap against the pen parts for size and fit, but don't fully assemble the pen just yet.

The write finish will be important

1 Sand the turned tubes with 220-, 400-, and 600-grit paper. For the best results, sand wooden turnings lengthwise (with the grain). You can leave them on the lathe as a convenient way to hold them while sanding, but don't finish-sand them with the lathe running.

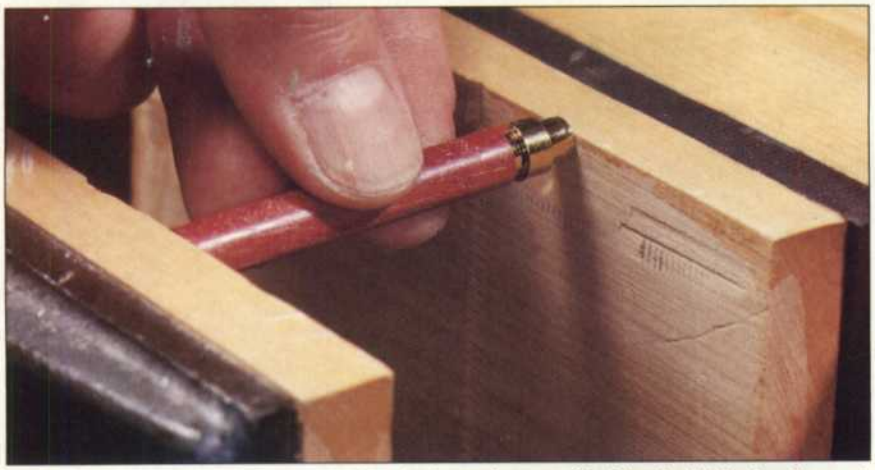
Wet-sand plastics and stabilized woods with the same grits. For these materials, where cross-grain scratches don't pose such a problem, you can sand with the lathe running. After sanding, Rus buffs the turned parts. (For a buffing cloth, he wets a rag with Brasso metal polish and lets it dry.) He gives the parts a final polishing on a cotton buffing wheel with white jeweler's rouge.

2 Apply a finish. Writing instruments take a lot of abuse, and dirt and oils on fingers can wear out finishes fast. That means you need a durable finish.

Rus suggests padding lacquer as the most successful finish for

With the blanks and sizing bushings in place and the knurled nut secured, the mandrel is ready to install on the lathe. The brass fitting at the left acts as a sliding stop.

Reaming a slight chamfer on the inside of the tube ends makes assembly easier. A parting tool does the job just fine.



Press the fittings into the turned tubes in the order specified by the kit instructions. A clamp or vise does the job without damage.

wooden pens. (For a home-brew version of this finish, mix equal parts of shellac, denatured alcohol, and boiled linseed oil. Apply it to the spinning turning with a soft cloth pad.) But even this finish will wear off eventually.

Synthetic materials generally stand up well to use, and require no further finishing after polishing.

Press the pen together

Pen styles differ slightly in assembly details. Refer to the instructions that came with your parts kit for pertinent information. Here are some general tips.

1 Lay out the pen parts in assembly order, following the drawing with the instructions. Check the fit of parts that slide into the brass tubes. For easier assembly, ream the tube ends slightly with a parting tool, as shown *left*.

2 Press the parts into the tubes, following the kit instructions. Don't try to drive the parts in with a mallet; a wooden-jawed vise, shown *below left*, or a clamp with jaw protectors will accomplish the task with minimal risk of damage.

You can cement the pressed-in parts in place for more permanence. Rus uses 3M ScotchWeld epoxy (no. 2216B/A) for this, mixing three parts gray with two parts white. He applies the adhesive sparingly, with a toothpick, and wipes off any squeeze-out immediately after assembly.

3 Finally, insert the pen ink refill, and adjust the cap, if necessary.

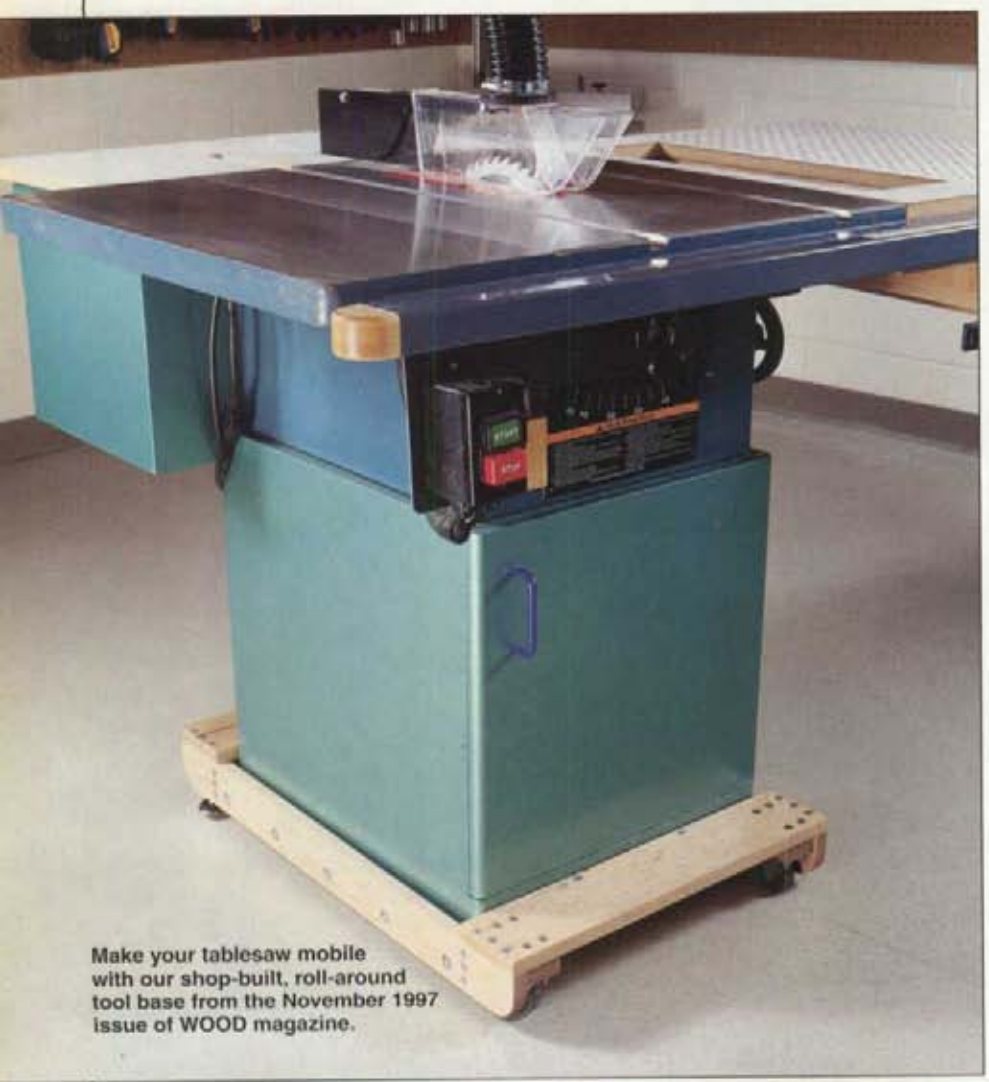
Buying Guide

Pen-turning tools, supplies. A full range of pen and pencil parts, turning accessories, drill bits, blanks, finishing materials, and other pen-turning necessities. Craft Supplies USA, 1287 E. 1120 S., Provo, UT 84606, or call 800/551-8876 for a catalog.

Drilling jig. Hinged jig as shown for drilling ½" and ¾" blanks. $19.45 ppd. in U.S. HUT Products for Wood, 15361 Hopper Rd., Sturgeon, MO 65284, or call 800/547-5461 to order.

Photographs: Hetherington Photography

3-in-1 Tablesaw



Make your tablesaw mobile with our shop-built, roll-around tool base from the November 1997 issue of WOOD magazine.

Attention all tablesaw owners! Now's your chance to make some big improvements in your equipment for just a few dollars. By following the directions on the next few pages and investing as few as a couple of evenings, you can enclose the base, add an outfeed table, and reduce the noise level of your saw. Now how can you beat that?

Note: *Our base and outfeed table were designed and built to fit a 10" Jet Contractor's Saw. The top of the base cabinet extends about ¾" on each side of the metal saw surround. You may have to alter the base size to fit your saw. The mobile base beneath the base cabinet appeared in the November 1997 issue (#100). The sanding table is shown on* page 18. *Find the dust-collecting blade-guard retrofit in the next issue (#107).*

Let's start with the base cabinet construction

1 Cut the base cabinet sides (A), back (B), and bottom (C) to the sizes listed in the Bill of Materials from ¾" medium-density fiberboard (MDF) or birch plywood. As noted on the Cutting Diagram, MDF measures 1" wider and longer than regular 4×8' sheet goods.

2 From ¾" solid stock (we recommend maple or birch), cut the ¾×¾" cleats (D, E, F) to the lengths listed in the Bill of Materials. (We ripped ¾"-wide strips from the edge of ¾" stock, and then crosscut the strips to length.) Next, cut the filler strips (G) to size.

3 Using the Base Cabinet Exploded View drawing for reference, mark the locations of the cleats on the inside face of the side and back panels (A, B). Then, drill countersunk mounting holes in the cleats and filler strips (D–G) where dimensioned on the Base Cabinet

Upgrade

Cleats drawing. Screw the cleats and filler strips in place.

4 Glue and screw the basic cabinet assembly (A, B, C) together in the configuration shown on the Base Cabinet Exploded View drawing. Be sure to check for square.

5 Working on the outside of the cabinet, sand the joints between the two side panels (A) and back panel (B) smooth. Then, rout a ½" round-over along the *back* corners of the cabinet.

Now, add the toekick, door, and bag holder

1 Measure the width of the base cabinet, and cut the toekick (H) to size. The toekick should be as long as the cabinet is wide. Rout ½" round-overs along its ends, and screw it in place.

2 Cut the door (I) to size. The door should be as wide as the assembled cabinet and ⅛" less in height than the opening. This allows for 1/16" clearance above and below the installed door.

3 Rout ½" round-overs along the sides of the door. Then, cut a rabbet along one edge of the door for the continuous hinge. Locate and drill a pair of holes for the wire pull. Hinge the door in place to test the fit.

4 Working from the top of the cabinet, measure the opening and cut the saw-mount cleats (J) to size. Drill a pair of countersunk mounting holes at each end of each cleat, where shown on the Base Cabinet Cleats drawing. Screw the cleats in place. With the aid of a helper, position your tablesaw on the base cabinet. Now, mark the hole locations on the cleats (J) needed to secure the tablesaw to the cleats.

5 From ½" plywood, cut the bag holder (K) to size. Place a large garbage bag over the bag holder, and slide the holder into place. If the fit is too tight, trim the edges of the bag holder.

Next, add the outfeed table/motor enclosure

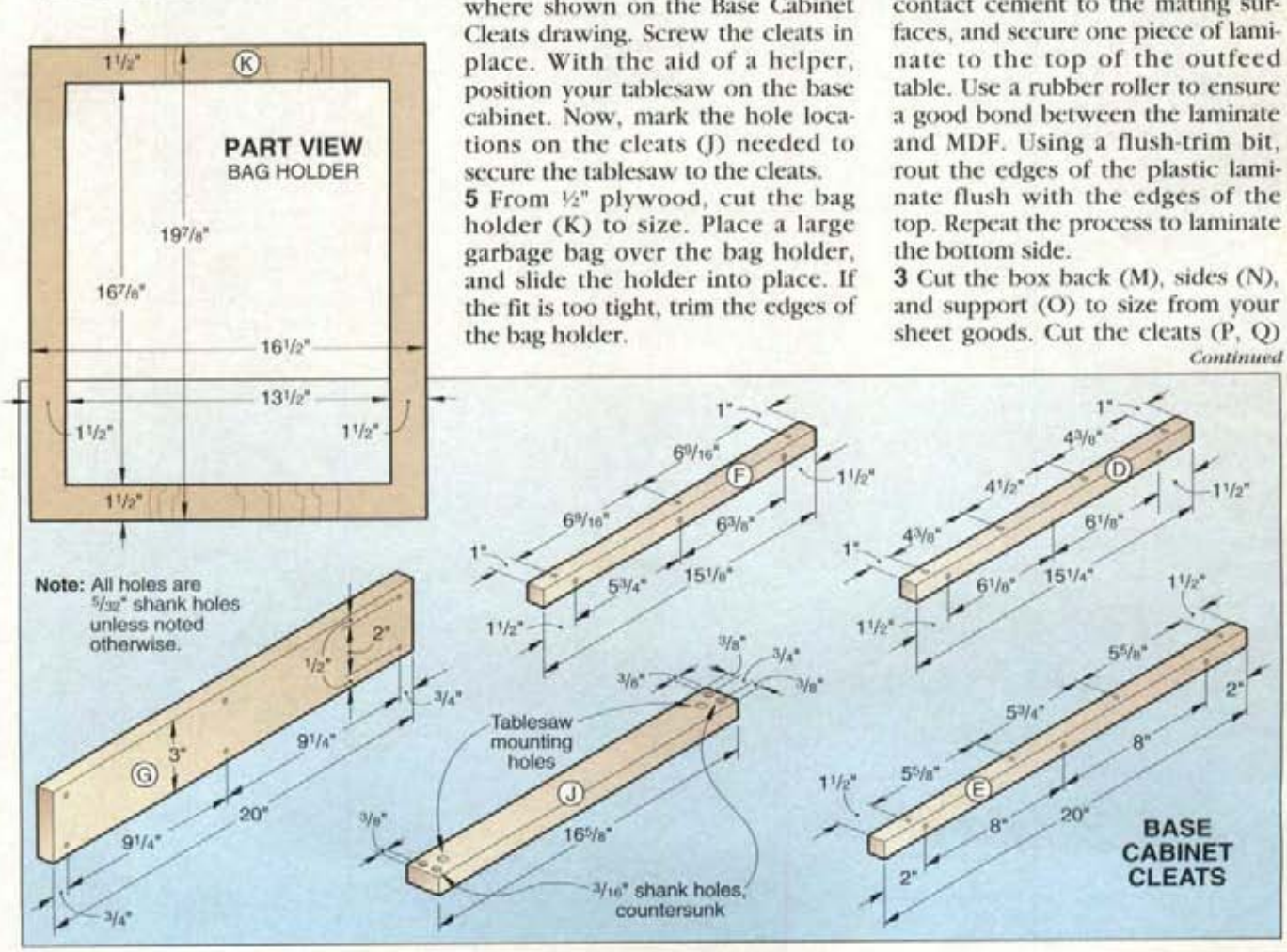
Note: *Since tablesaw fences vary, review the Fence Configurations drawing to determine how to fit our outfeed table/motor enclosure with your fence. You'll need to adjust the mating pieces accordingly. When adding the assembly, keep the top surface of the outfeed table 1/16" below the top surface of the saw table.*

1 Cut the top (L) to size, radiusing the back two corners where shown on the Outfeed Table/Motor Enclosure drawing.

2 Cut two pieces of plastic laminate to the same size as the top plus 1" in length and width. Apply contact cement to the mating surfaces, and secure one piece of laminate to the top of the outfeed table. Use a rubber roller to ensure a good bond between the laminate and MDF. Using a flush-trim bit, rout the edges of the plastic laminate flush with the edges of the top. Repeat the process to laminate the bottom side.

3 Cut the box back (M), sides (N), and support (O) to size from your sheet goods. Cut the cleats (P, Q)

Continued



Tablesaw Upgrade

to size from solid stock. Then, cut the bottom (R) from ¼" perforated hardboard.

4 Assemble the box in the configuration shown on the drawing. Rout round-overs along the back edge where shown on the drawing. Test the fit of the box against your tablesaw and trim if necessary.

5 Position the outfeed table on the motor enclosure, and carefully mark a pair of miter-gauge slots in the top to align perfectly with those in your saw top. Cut or rout the grooves to an 8" length. (After marking the groove locations, we used a straightedge and a router fitted with a straight bit to rout the grooves.) Then, mark and cut the slot for the splitter/guard support.

You're almost done—just sand, paint, and assemble

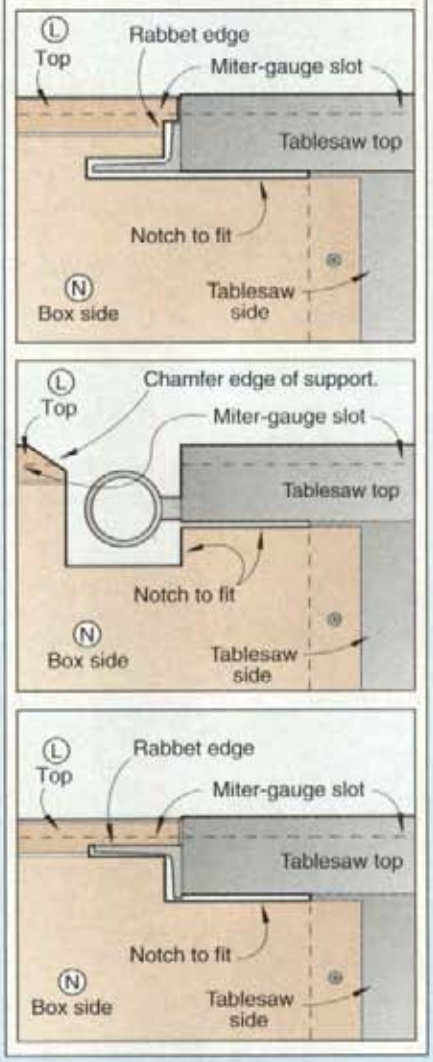
1 Fill any imperfections, and finish-sand the base cabinet, motor enclosure, door, and outfeed table.

2 Prime the assemblies. (We did this in several coats, using a sanding block with 220-grit sandpaper between coats to smooth the primer.) Paint the assemblies. See the article on *page 14* in the November 1997 issue to obtain the textured paint look we achieved on this cabinet and the rest of the cabinetry in IDEA SHOP® 3. Add a clear finish to the exposed edges on the outfeed table.

3 Hinge the door to the cabinet. Attach the wire pull and magnetic catch to the door.

Written by Marlen Kemmet
Project Design: James R. Downing
Illustrations: Kim Downing
Photographs: Hetherington Photography

FENCE CONFIGURATIONS (SIDE VIEW)



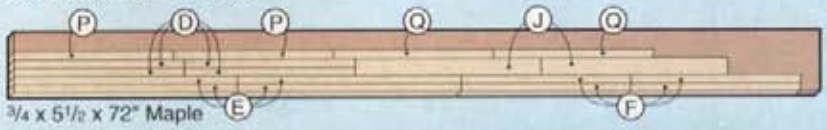
Bill of Materials

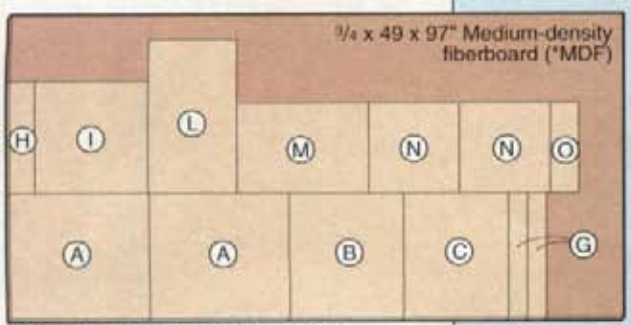
Part	Finished Size T	W	L	Matl.	Qty.
Base Cabinet					
A sides	¾"	20"	22"	MF	2
B back	¾"	18⅛"	22"	MF	1
C bottom	¾"	16⅝"	20"	MF	1
D cleats	¾"	¾"	15¼"	H	4
E cleats	¾"	¾"	20"	H	4
F cleats	¾"	¾"	15⅛"	H	4
G filler strips	¾"	3"	20"	MF	2
H toekick	¾"	4"	18⅛"	MF	1
I door	¾"	17⅛"	18⅛"	MF	1
J cleats	¾"	1½"	16⅝"	H	2
K bag holder	½"	16½"	19⅛"	PL	1
Outfeed Table/Motor Enclosure					
L top	¾"	14"	25"	MF	1
M back	¾"	13¾"	21¼"	MF	1
N sides	¾"	13¾"	14¾"	MF	2
O support	¾"	4½"	12½"	MF	1
P cleats	¾"	¾"	13¾"	H	2
Q cleats	¾"	¾"	10"	H	2
R bottom	¼"	13⅛"	22¼"	PH	1

Materials Key: MF–medium-density fiberboard, H–hardwood (maple or birch), PL–plywood, PH–perforated hardboard.

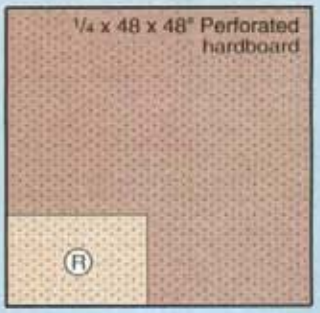
Supplies: #8x1¼" flathead wood screws, #8x1¼" roundhead wood screws, #10x2" flathead wood screws, plastic laminate, 3" wire pull, magnetic catch and strike plate, 1½" continuous hinge 17⅞" long, primer, paint, clear finish.

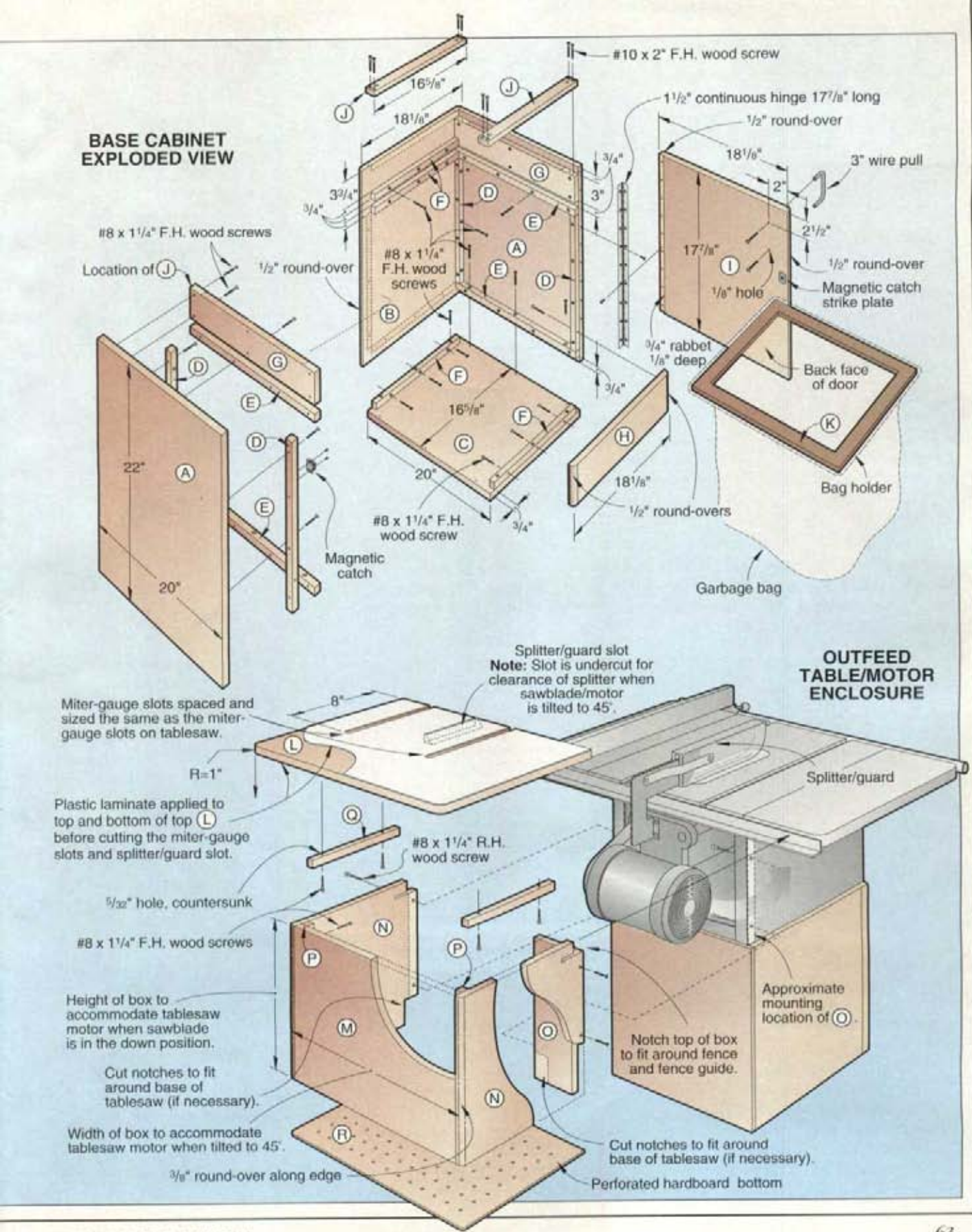
CUTTING DIAGRAM





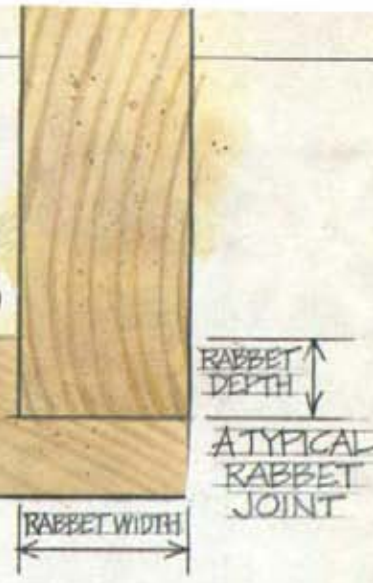
*Standard 4x8 sheet particleboard will work in place of MDF.




BASE CABINET EXPLODED VIEW
#10 x 2" F.H. wood screw
16⅝"
18⅛"
1½" continuous hinge 17⅞" long
½" round-over
18⅛"
3" wire pull
2"
2½"
3¾"
¾"
3"
#8 x 1¼" F.H. wood screws
Location of J
½" round-over
#8 x 1¼" F.H. wood screws
17⅞"
½" round-over
⅛" hole
Magnetic catch strike plate
¾" rabbet ⅛" deep
Back face of door
16⅝"
20"
18⅛"
Bag holder
#8 x 1¼" F.H. wood screw
¾"
½" round-overs
22"
20"
Magnetic catch
Garbage bag
OUTFEED TABLE/MOTOR ENCLOSURE
Splitter/guard slot
Note: Slot is undercut for clearance of splitter when sawblade/motor is tilted to 45°.
Miter-gauge slots spaced and sized the same as the miter-gauge slots on tablesaw.
8"
R=1"
Splitter/guard
Plastic laminate applied to top and bottom of top L before cutting the miter-gauge slots and splitter/guard slot.
#8 x 1¼" R.H. wood screw
5/32" hole, countersunk
#8 x 1¼" F.H. wood screws
Approximate mounting location of O
Height of box to accommodate tablesaw motor when sawblade is in the down position.
Notch top of box to fit around fence and fence guide.
Cut notches to fit around base of tablesaw (if necessary).
Width of box to accommodate tablesaw motor when tilted to 45°.
Cut notches to fit around base of tablesaw (if necessary).
⅜" round-over along edge
Perforated hardboard bottom

5 Ways to Make Precision Rabbet Cuts

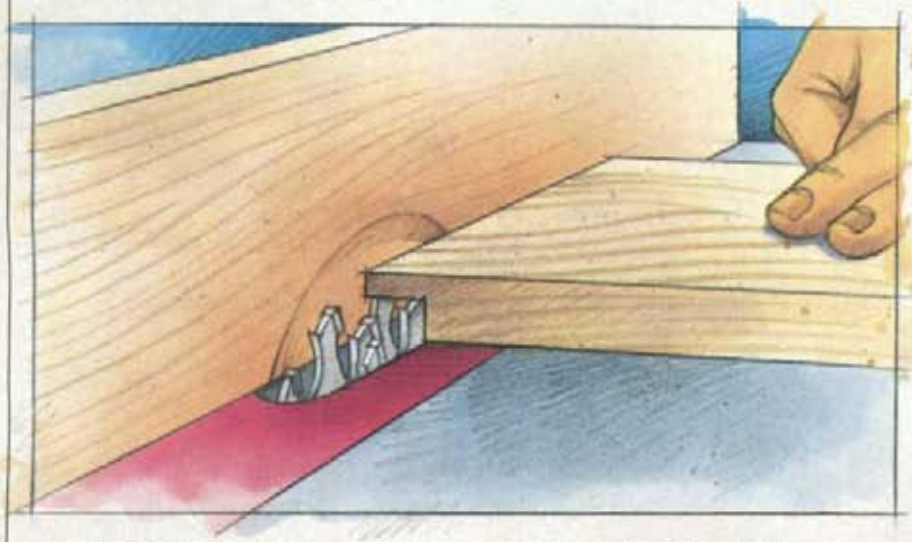
Basic techniques every woodworker should master

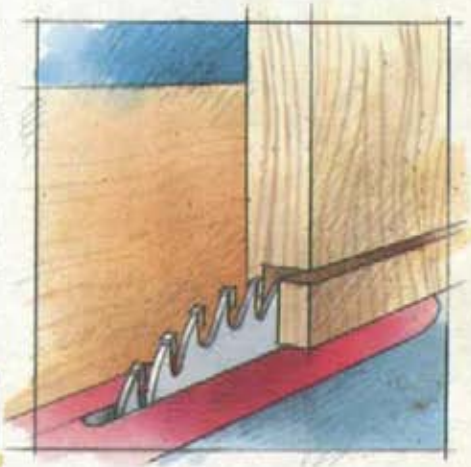


Although simple in appearance, there's more to the rabbet cut than first meets the eye. To make the best use of rabbets, you need to know the various ways to cut them, when to use each method, and how to make the cuts effectively.

A rabbet is simply a rectangular recess along the edge or end of a workpiece. Although most often found as a joint in casework (see illustration *above*), a rabbet also can pop up as a design feature in a molding, as a recess for holding artwork in a picture frame, along the edges of a cabinet door to help recess it partway into its face frame, or as a half-lap or shiplap joint.

In the *WOOD*® magazine shop we cut rabbets with a tablesaw (set up with a dado set or combination blade), router (handheld or table-mounted), or jointer. The choice depends on the type and quantity of workpieces, and the desired quality of the rabbet cut. Here's what you need to know about each method.





1 ***Tablesaw with a dado set.*** We use this setup often because it yields clean rabbets in one pass typically—two passes for wide rabbets. For good results, you need a high-quality dado set. Since it takes a little time to install the dado blades, we use this method only if we have several workpieces to cut.

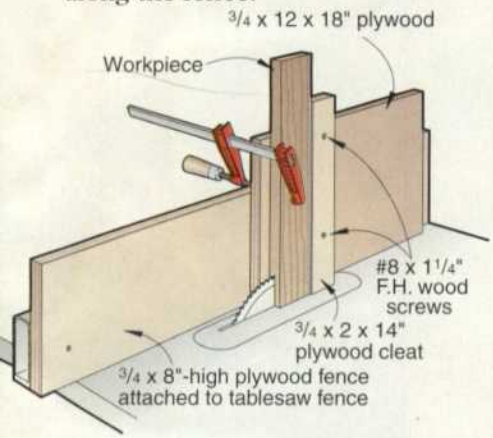
To do this successfully, first attach a ¾" wooden face to your tablesaw fence. By doing this you can cut into the wooden face and fine-tune the width of the rabbet with quick fence adjustments.

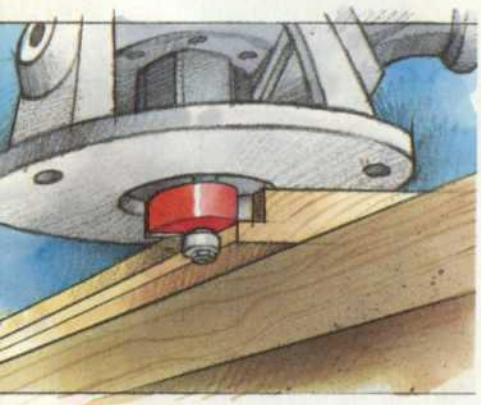
2 ***Tablesaw with standard blade.*** If we're rabbeting just a piece or two, we'll leave our combination blade in the tablesaw and make the cut in two passes. The key: You need to precisely set the fence, and the height of the blade, for both cuts so one doesn't cut beyond the other.

First, cut the rabbet to its correct depth with the workpiece facedown on the tabletop. Then, stand the piece on edge to cut the rabbet to width.

If you don't own a good dado set, or have a low-powered saw, this option may prove better than No. 1 for all of your work. But, it can be tricky if you need to rabbet the end of a narrow workpiece. In that case, you will need to clamp

the workpiece to a fixture like the one shown *below* that holds it steady and upright as you guide it along the fence.

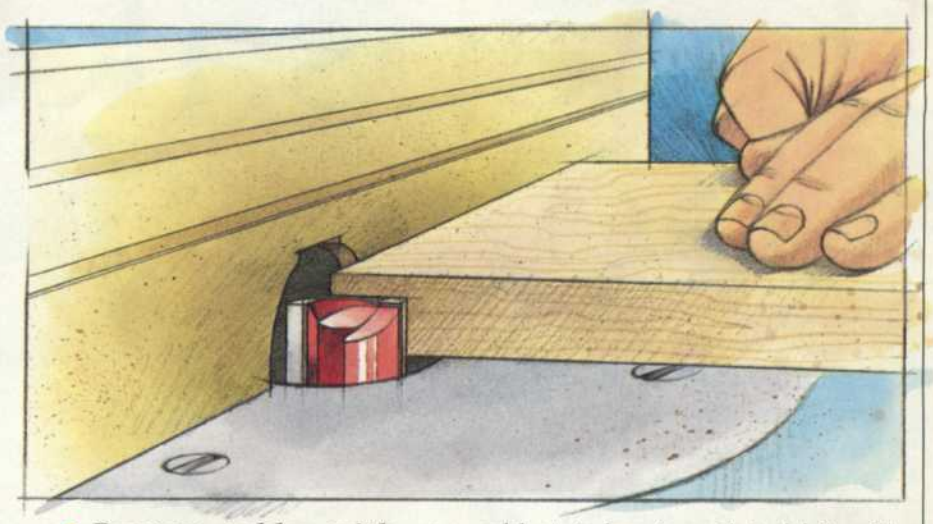

3/4 x 12 x 18" plywood
Workpiece
#8 x 1 1/4" F.H. wood screws
3/4 x 2 x 14" plywood cleat
3/4 x 8"-high plywood fence attached to tablesaw fence



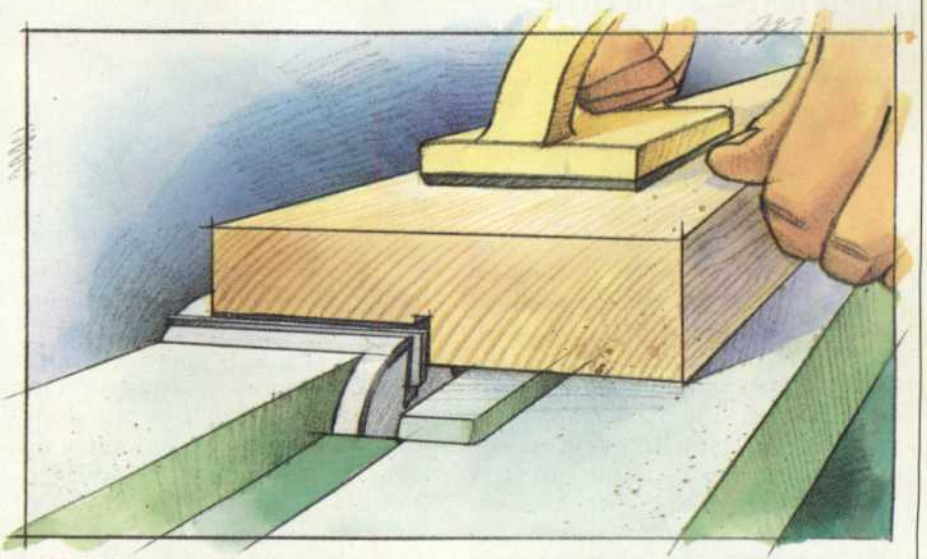
3 *Handheld router with rabbeting bit.* Unlike saw blades and dado sets, router bits do not leave tiny scoring marks. So, use a router bit if the surface or ends of the rabbets will be visible in your finished project.

Router bits are your only option if you need to rabbet an opening inside a surface rather than along an outside edge or end. Examples include a router-table opening for receiving a router plate, or the inside of an assembled doorframe for accepting a piece of glass.

With a handheld router you typically use a rabbeting bit with a pilot bearing as shown *above*. You can change the width of the cut simply by changing bearings. And, with this setup you can even cut rabbets along curved edges.



4 *Router table with a straight bit.* Although you can't easily rabbet large pieces on a router table, this method has some distinct advantages over a handheld router. First, a router table has a fence that ensures a perfectly straight rabbet (a bearing-piloted bit will follow any irregularities in the workpiece edge). And, although a piloted rabbeting bit will help you cut a rabbet up to ½" wide and ½" deep, you can put a large straight bit in a router table and cut rabbets up to 1×1".



5 *Jointer.* We admit we rarely use a jointer to cut rabbets, but if you must cut a perfectly smooth rabbet over 1" wide, and along a straight, outside edge, look to a jointer. You can cut a rabbet as wide as the length of your jointer's cutterhead. The maximum cutting depth of your jointer will limit the depth of the rabbet, typically to ½".

To do this, you need to make an initial cut with your tablesaw. First, set the blade height to match the depth of the rabbet. Adjust the fence-to-outside-of-blade distance to match the rabbet width. As shown *above*, this cut will prevent the end of the jointer's knives from hammering the workpiece. Remove no more than ⅛" with each jointer pass.

Written by Bill Krier with Chuck Hedlund Illustrations: Kim Downing; Brian Jensen

Country All-Star Keepsake Box

Growing up in Pennsylvania, woodworker/designer Patrick Leonard visited many art festivals and exhibits. Quilts were a popular item, and the star pattern, with its infinite variations, was one that frequently caught his eye. Today, Patrick incorporates that time-honored design to top off his fashionable hardwood keepsake boxes. If you're looking for a project that's a surefire crowd-pleaser, we hope you'll agree, this is it.

Let's begin with the base and lid pieces

1 Rip and crosscut a piece of ½" walnut to 1" wide by 26" long for the lid pieces (A) and a second ½" piece to 2¼" wide by 26" long for the base pieces (B). Notice on the Cutting Diagram how we cut these two pieces side-by-side from the same stock so the grain would match between the lid and base later. Use your own stock or see the Buying Guide for our source.

2 Use Forming the Lid Profile drawing for reference to machine the 1"-wide lid strip. Repeat the process using Forming the Base Profile drawing to shape the base strip.

3 Miter-cut eight pieces at 22½° to 2⅞" long to form the lid pieces (A). Number the pieces in the order they were cut to align the grain when gluing them together later.

4 Repeat step 3 to cut and number the base sides (B).

It's time to miter-cut the diamonds

1 Build the jig shown on the Miter Jig drawing. Angle your miter gauge 45° from center. Position the jig against the miter gauge so the adjustable stop is ¾" away from the blade where shown on the drawing. Drill pilot holes, and screw the jig to the miter gauge.

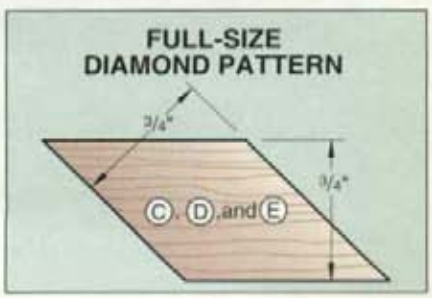
2 Cut a piece of walnut to 5/32×¾×18", two pieces of maple to 5/32×¾×18", and four pieces of oak to 5/32×¾×20". Make a 45° miter-cut at one end of each strip. These strips will be used for the diamonds (C, D, E).

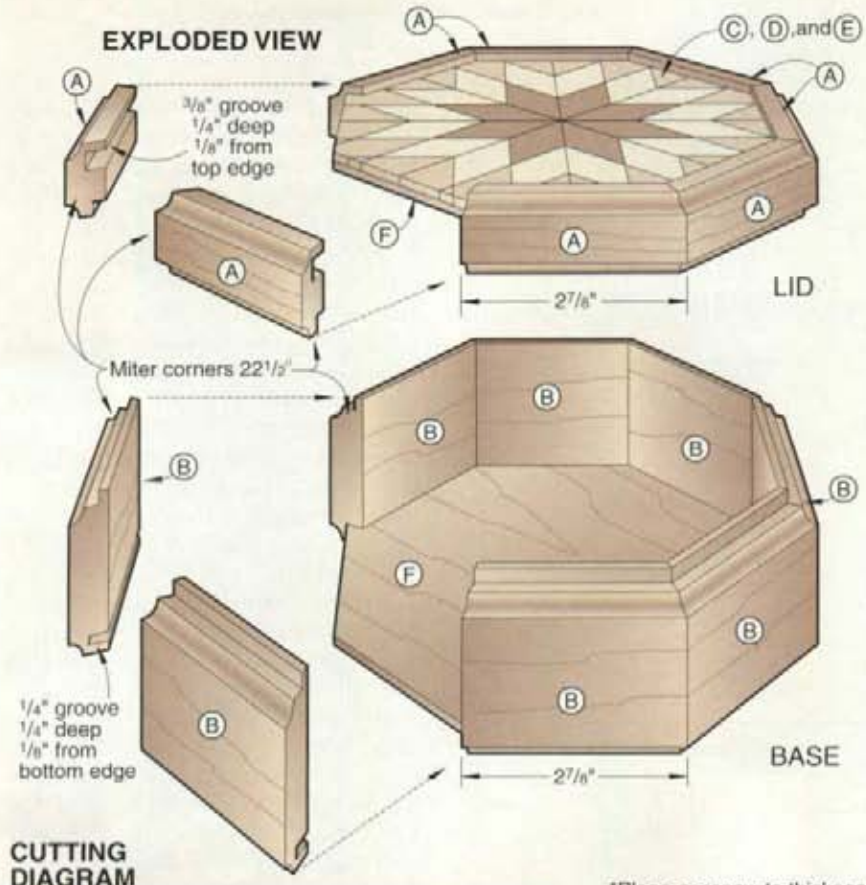
3 Raise the blade on your tablesaw ¼" above the surface of the jig base.

4 As shown in *photo A*, place the mitered end of one of the strips against the stop, and miter-cut a test diamond. Position the wood diamond on the Full-Size Diamond Pattern. If necessary, adjust the stop and jig angle so the piece just cut is the same length and shape as the full-size pattern.

5 Miter-cut the diamonds from each strip. (We used the eraser end of a pencil to hold the diamond being cut in place.) After pushing the strip through the blade to make the cut, remove the diamond from the jig *before* moving the jig back across the blade for the next cut.

Continued





Bill of Materials					
Part	Finished Size			Matl.	Qty.
	T	W	L		
A lid sides	½"	1"	2⅛"	W	8
B base sides	½"	2¼"	2⅞"	W	8
C walnut diamonds	⅛"	¾"	¾"	W	8
D maple diamonds	⅛"	¾"	¾"	M	16
E oak diamonds	⅛"	¾"	¾"	O	40
F panels	¼"	6½"	6½"	P	2

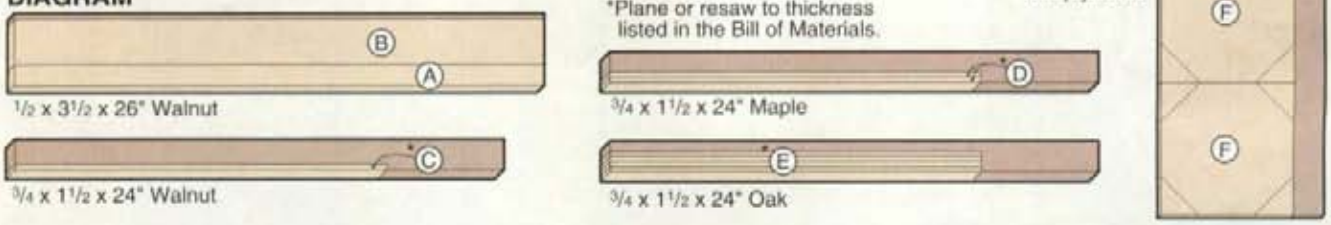
Pieces are cut oversized to start. See the how-to instructions for cutting the pieces to the finished sizes shown above.

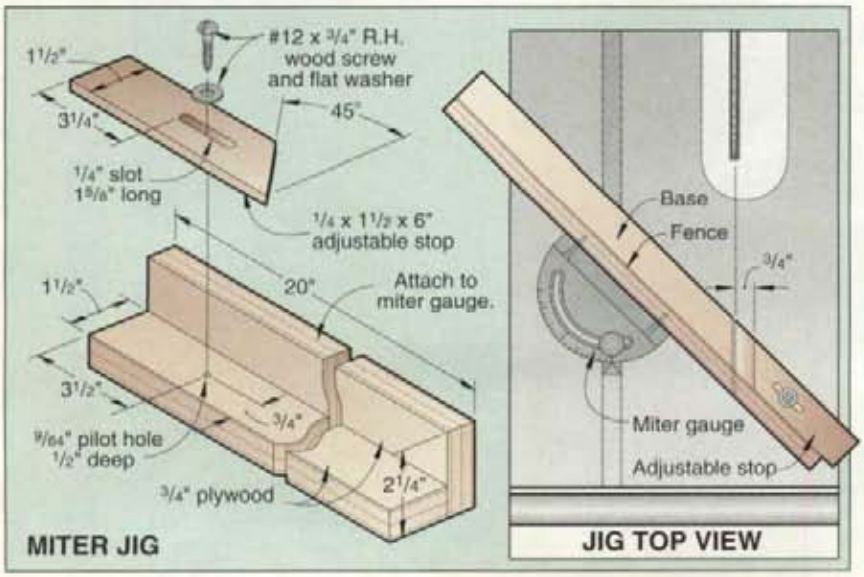
Materials Key: W–walnut, M–maple, O–oak, P–walnut or oak plywood.

Supplies: clear finish.

Buying Guide

Hardwood kit. All the individual pieces shown on the Cutting Diagram are cut oversized from the thickness and species listed in the Bill of Materials. Kit no. W1061, $11.95 ppd. for one; five for $48.95 ppd. Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537. Call 800/524-4184 to order.


CUTTING DIAGRAM
*Plane or resaw to thickness listed in the Bill of Materials.
B
A
1/2 x 3 1/2 x 26" Walnut
D
3/4 x 1 1/2 x 24" Maple
C
3/4 x 1 1/2 x 24" Walnut
E
3/4 x 1 1/2 x 24" Oak
1/4 x 8 x 16" Walnut or oak plywood
F
F



Using the miter jig, miter-cut the diamond pieces to size from the hardwood strips.

Keepsake Box

Now, let's glue the diamonds to the top panel

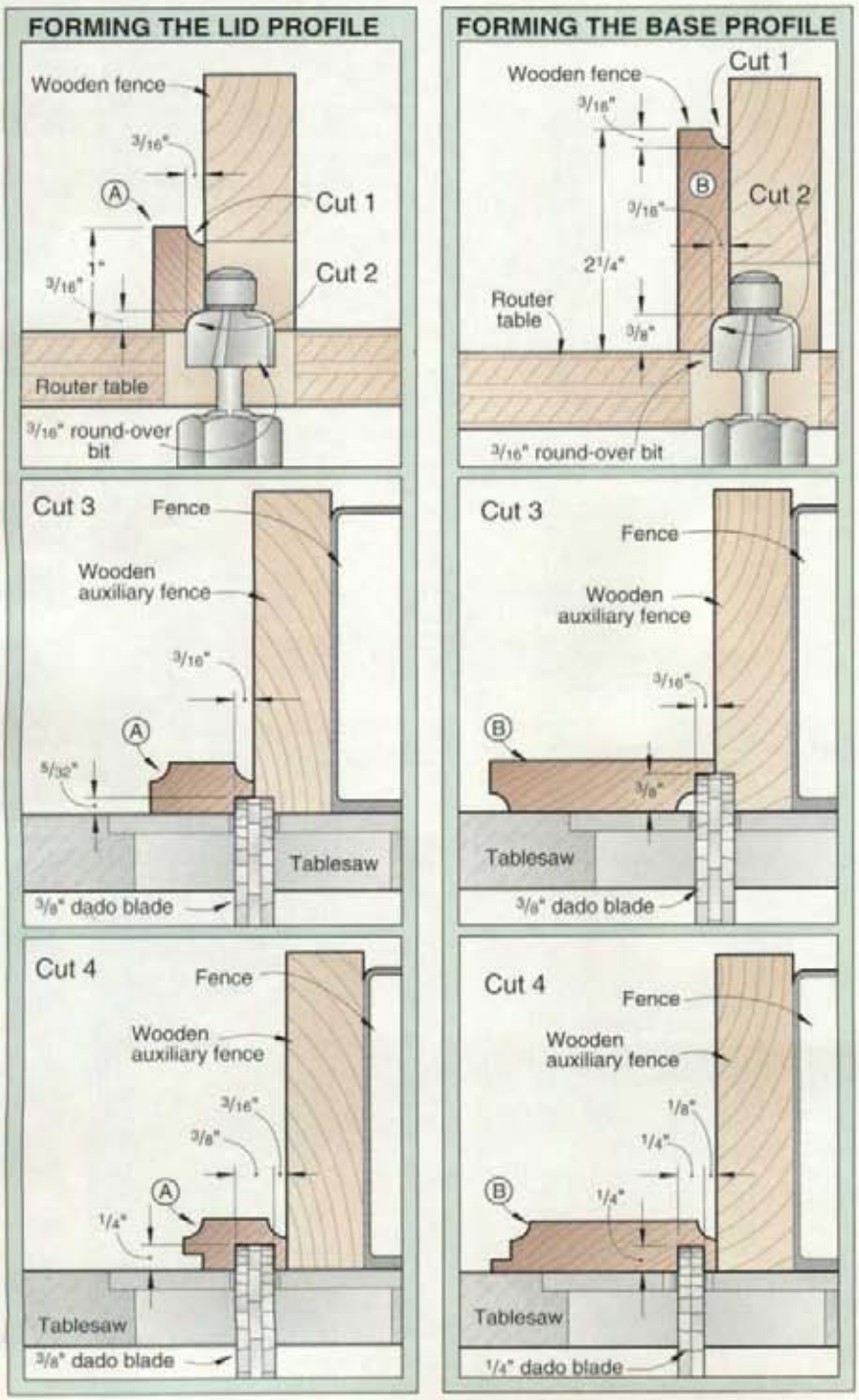
1 Cut two 6½" square pieces of ¼" walnut or oak plywood for the top and bottom panels (F). Mark centerlines on the top panel where shown on the Lid Panel drawing on the *opposite page*.

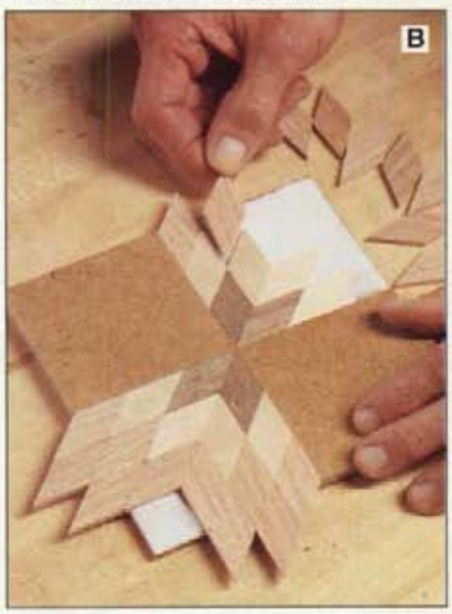
2 Cut two 3¼" squares from ⅛" hardboard. Stick the two 3¼" squares caddy-corner from each other on the unveneered face of the ¼" plywood top panel (F) with double-faced tape. Use a square to make sure the 3¼" hardboard squares are positioned at a right angle to each other.

3 Spread glue on one of the exposed square areas of the top panel. Position the diamonds (C, D, E) tightly into the corners and against each other on glue-covered areas as shown in *photo B*. (We used white glue for the extended working time.) Position waxed paper and a clamp block on top of each glued-up pattern, observing the pieces closely so they don't spread apart.

4 Remove the two taped-on 3¼" hardboard squares from the top panel, and repeat the process to cover those areas with the hardwood diamonds. Now, before the glue is fully dried, clamp the top panel to a flat surface to keep it from cupping. (Left unclamped, the top panel with the glued-on diamonds might cup as the glue dries.)

5 Fit your bandsaw with a fine-toothed blade, and trim the overhanging portions of the diamonds flush with the edges of the top panel (F). Sand the cut edges flat.





Use two square positioning blocks to align the diamonds when gluing them to the top panel.

6 Position the top panel upside down on your workbench. Mark cutlines on the plywood to form a perfect octagon. See the Lid Pattern drawing on *page 80* for reference. Bandsaw along these lines to cut the top panel to final shape. Repeat for the bottom panel

7 Sand the top surface of the top panel smooth and until it fits into the ⅜" groove in the lid pieces (A).

Here comes the fun part–assembling the pieces

1 Line up the base sides in the order they were cut and numbered, inside face down. This allows the grain to wrap around the base. Use masking tape to tape the pieces together at the miter joints, using a straightedge to keep the edges flush. See *photo C* for reference.

2 Wrap the taped-together pieces around the bottom panel to check the fit; adjust if necessary.

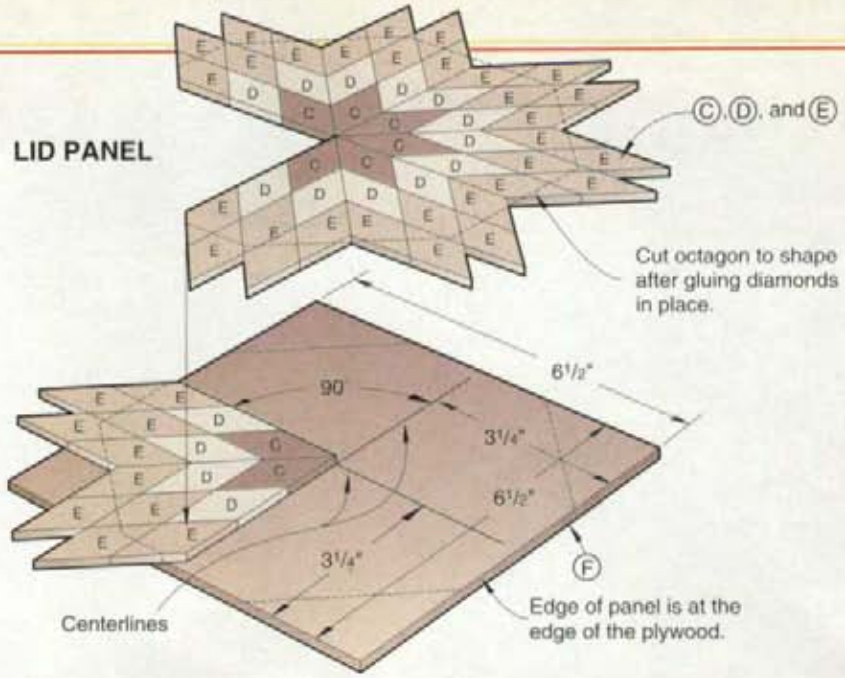
3 Use a small brush (we used an acid brush) to spread an even coat of glue on the miter joints.

4 Roll the taped-together base side pieces around the bottom panel (F) as shown in *photo D*. Use a band clamp or rubber bands to clamp the box sides to close the joints tight. Wipe off any excess glue with a damp cloth. Then, place the clamped-together assembly on a flat surface with a weight on top of it to hold it flat while it dries. Let the assembly dry overnight.

5 Repeat the process with the lid sides and lid panel. Wipe off any glue squeeze-out with a damp cloth, and place the lid on the base to test the fit of the two assemblies. Let the glued-together lid dry while fitted to the base.

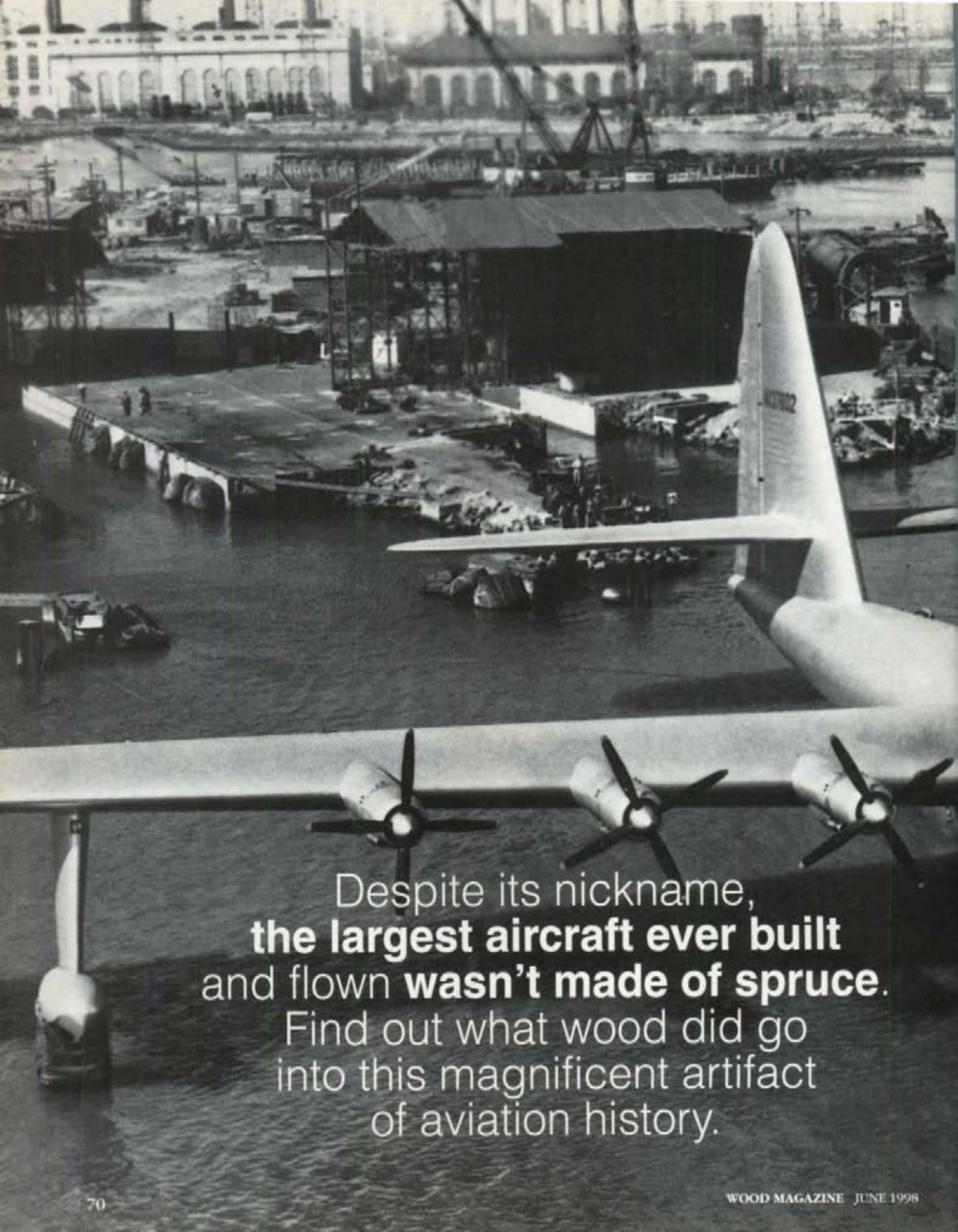
6 Finish-sand the box and lid. (We wrapped sandpaper around a ⅜" dowel to sand the coves.) Apply a clear finish (we used satin polyurethane) to the base and lid.

Written by Marlen Kemmet
Project Design: ©Patrick Leonard
Washington, Pennsylvania
Illustrations: Kim Downing, Lorna Johnson
Photographs: Hetherington Studio

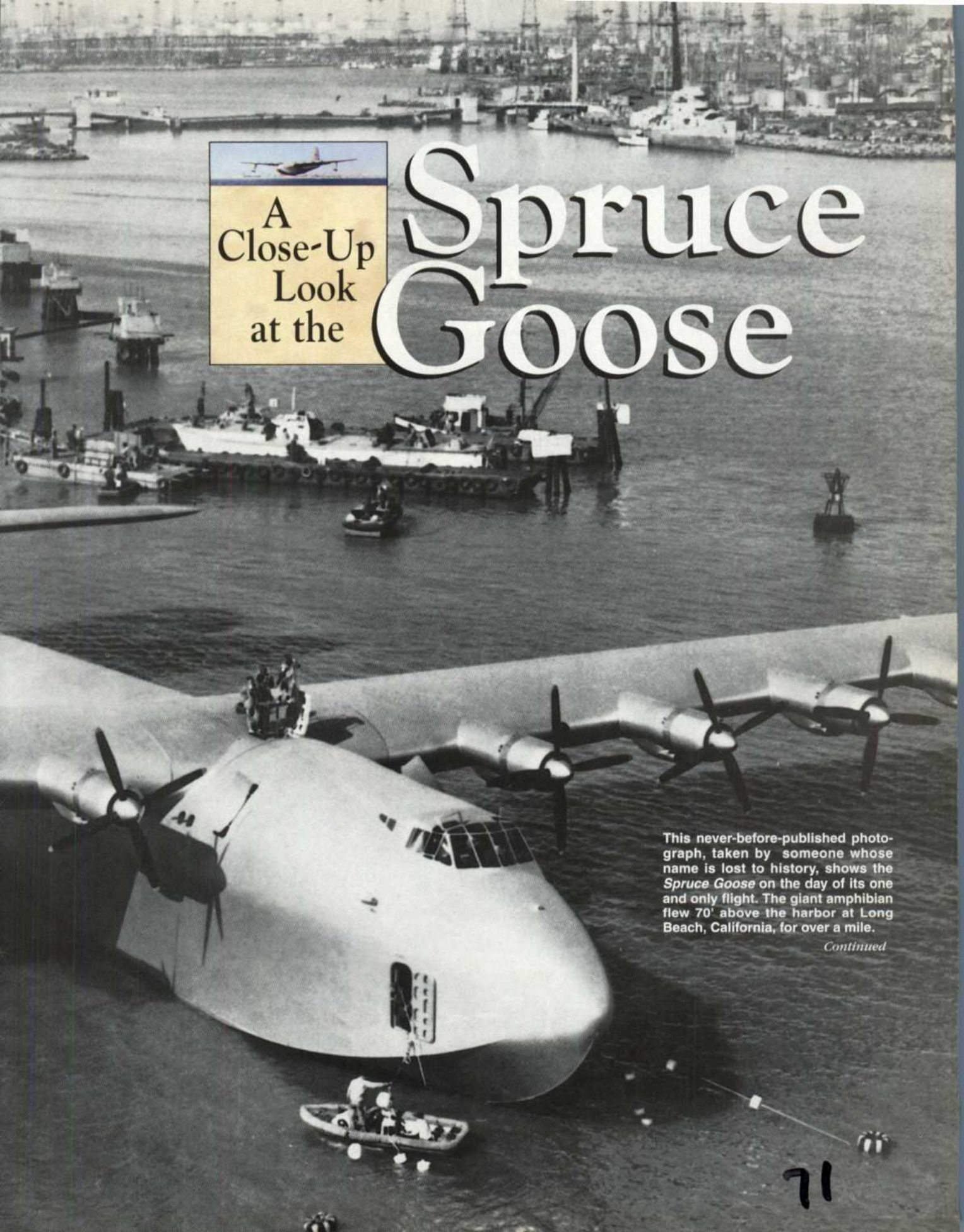


Use a straightedge to align one edge of the base pieces when taping them together at the miter joints.

Wrap the taped-together side pieces around the base panel. Use a band clamp to pull the joints tight.



Despite its nickname,
the largest aircraft ever built
and flown **wasn't made of spruce**.
Find out what wood did go
into this magnificent artifact
of aviation history.



A Close-Up Look at the Spruce Goose

This never-before-published photograph, taken by someone whose name is lost to history, shows the *Spruce Goose* on the day of its one and only flight. The giant amphibian flew 70' above the harbor at Long Beach, California, for over a mile.

Continued

On Sunday morning, November 2, 1947, Howard Hughes sat behind the controls of his HK-1 flying boat as it floated on the harbor waters off Long Beach, California. As he efficiently turned switches on the panel, the aircraft's eight 3,000-hp engines roared to life.

With members of the press aboard and the shoreline filled with spectators, the huge wooden cargo plane began a series of taxi tests, lumbering to speeds up to 90 mph on the choppy water. When the HK-1 came to a stop, all reporters save one went ashore to file their stories. The remaining newsman, James McNamara of Los Angeles radio station KLAC, stayed aboard to interview the pilot.

He was in for a thrill, because without warning, Hughes once again revved the engines. Then, turning the mighty aircraft into the wind, he set the flaps to 15° for takeoff. The giant plane surged forward and upward as it smoothly, almost effortlessly, became airborne.

Hughes kept it 70' in the air for a little over a mile before easing it down for a landing. That epic flight was the first and last for the woodworking marvel called the *Spruce Goose*.

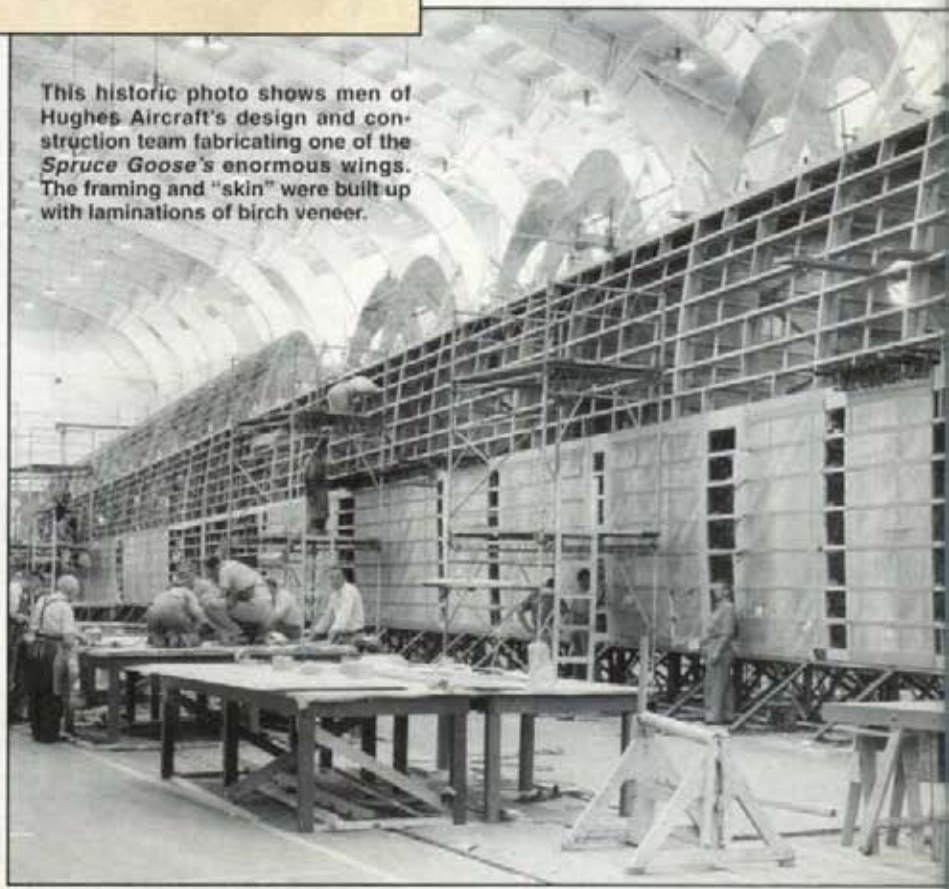
How the *Spruce Goose* came to be

Early in World War II, shipbuilder Henry Kaiser had the idea of building flying boats that could escape the danger of enemy submarines to deliver troops and supplies to battle theaters overseas. Teaming up with Howard Hughes and his design and construction team, Kaiser landed contracts in November 1942 worth $18 million to build three HK-1 (Hughes-Kaiser, 1st aircraft) flying boats. The contracts stipulated that the aircraft were to be constructed within two years, using material noncritical to the war effort.

Within months, Kaiser withdrew from the project. So Hughes unofficially called it the H-4. But the aircraft soon took on the then derisive misnomer *Spruce Goose* due to its all-wood construction.

Public funding was blocked by a U.S. Senate committee investigation in 1945. The HK-1 was only three-quarters complete. Hughes,

Workers in Howard Hughes' Culver City, California, hangar build what appears to be pontoon pods for the HK-1 flying boat.



This historic photo shows men of Hughes Aircraft's design and construction team fabricating one of the *Spruce Goose's* enormous wings. The framing and "skin" were built up with laminations of birch veneer.

though, resolved to finish the project with his own millions.

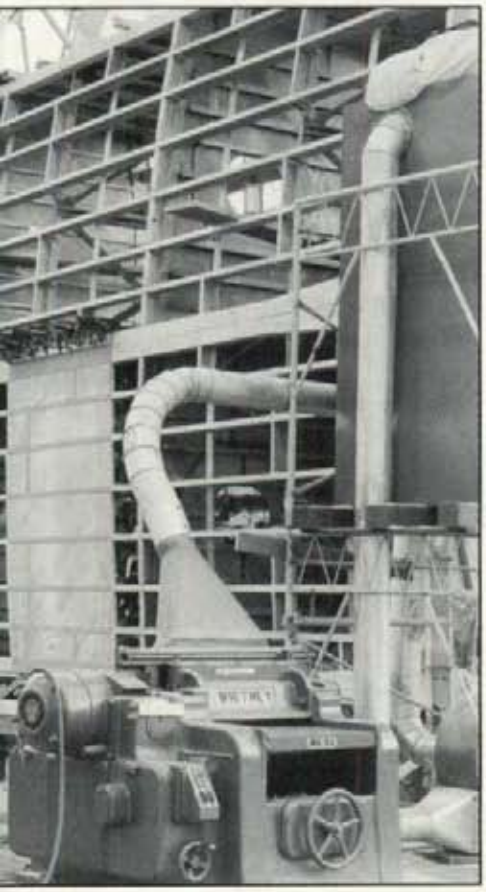
He did, but three years behind schedule and need. Yet, the November 2, 1947, flight proved to his detractors that such a mammoth aircraft could indeed be successfully engineered.

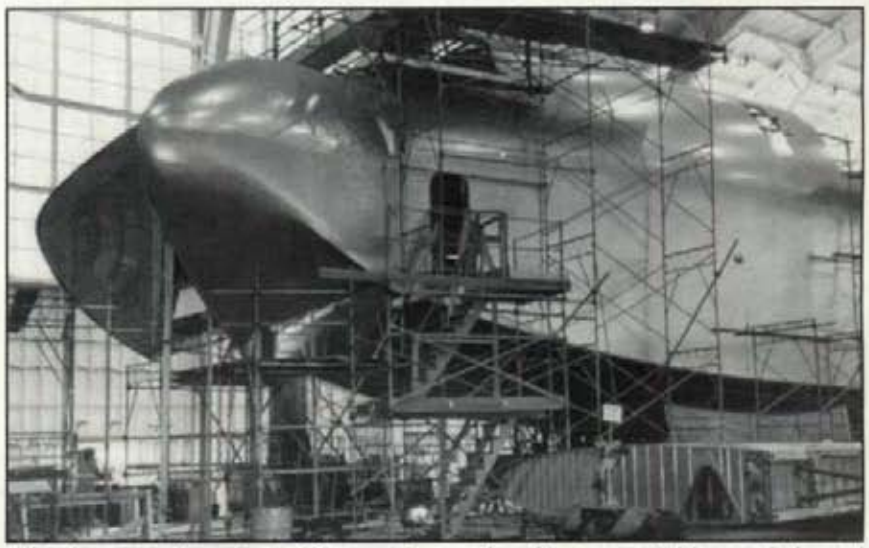
How the Hughes flying boat was built

Metals, such as aluminum, were directed to the war effort and not available for prototype aircraft such as the HK-1. That left wood, a material not unknown to aviation. Because of its great strength-to-weight ratio, the Hughes design team chose yellow birch, laid up in laminations, for major components of the wing (see photo *below*) and fuselage framing as well as the skin. Small amounts of spruce, poplar, maple, and balsa also were used. All of the flying boat's control surfaces (rudder, ailerons, etc.) except the flaps were fabric-covered.

The laminating process that produced the birch plywood for the aircraft was long used by Hughes' friend, Sherman Fairchild, himself an aircraft builder. Called Duramold, it required epoxy resin glues and thin (1/32") birch veneer. The 1"-thick hull was composed of 32 layers laminated with epoxy. (Some structural components had as many as 50 laminations!) To exert the pressure necessary to temporarily keep the curved skin-laminations together while the epoxy cured, workers used thousands of small nails—about eight tons in all.

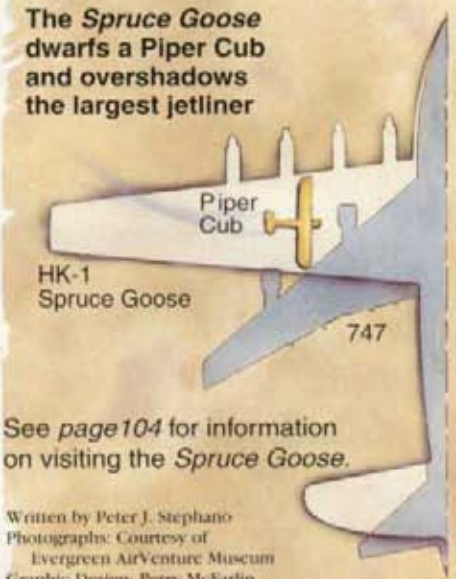
The exterior finish on the HK-1 consisted of one coat of sanded wood filler, a coat of sealer to act as a cement for the thin tissue placed over it, then two coats of spar varnish. A final coat of aluminized spar varnish gave the aircraft a metallic look, as shown in the photo *below*. And although aluminum later became available, Hughes preferred this smooth finish to one peppered by rivets that produced drag in flight.





The glass-smooth surface of the monstrous aircraft was created by sanded wood filler on the plywood panels, a sealer covered with thin tissue, two coats of clear spar varnish, and a topcoat of aluminized spar varnish.

The *Spruce Goose* dwarfs a Piper Cub and overshadows the largest jetliner



See *page104* for information on visiting the *Spruce Goose*.

Written by Peter J. Stephano
Photographs: Courtesy of Evergreen AirVenture Museum
Graphic Design: Perry McFarlin
Illustration: Kim Downing

Dimensions
Wingspan: 319.92'
Wing thickness: 13'
Overall length: 218' 6"
Tailspan: 113.5'
Vertical tail height: 49' 6"
Fuselage height: 30'
Fuselage width: 25'
Gross weight: 400,000 lbs.

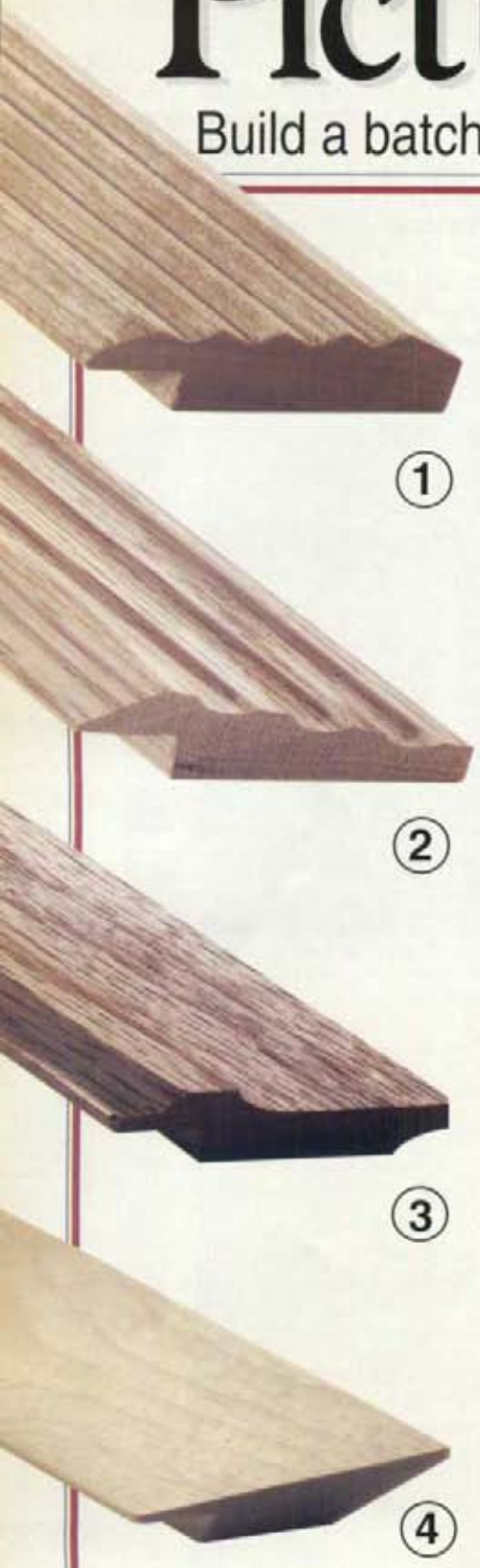
Power
8 Pratt and Whitney 28-cylinder R-4360s rated at 3,000 hp each (largest radial reciprocating engines ever built)
Four-bladed Hamilton standard propellers with diameters of 17'2"

Designed performance
Cruising speed: 200 mph
Maximum range: 3,000 miles
Maximum rate of climb at sea level: 1,000' per minute

Capacities
Payload: 130,000 lbs.
Fuel capacity: 14,000 gallons

Picture Frames,

Build a batch of good-looking picture frames using our



Preserve your fondest photos of friends and loved ones by surrounding them with handsome picture frames of your own making. Here, we'll tell how to do it, from sizing, styling, and cutting to assembling and mounting.

Size your frame and select the stock

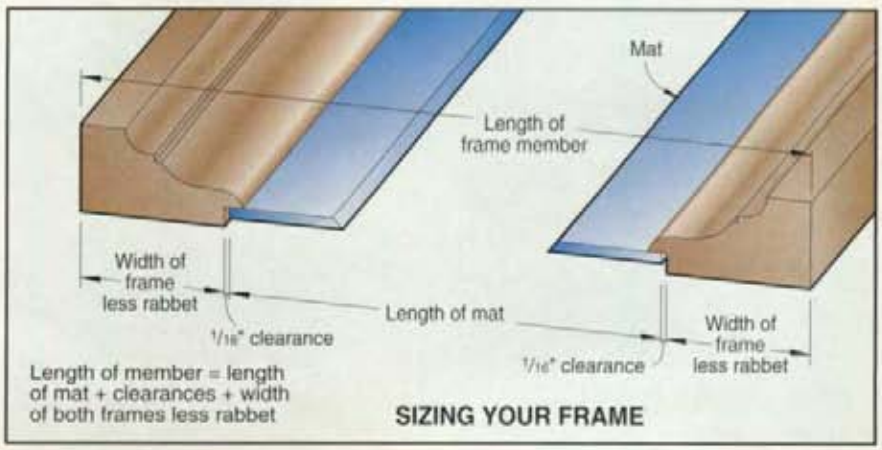
The biggest determinant in figuring how large and what shape to make your picture frame always comes down to the art package. This includes the glass, mat, photo or artwork, mounting board, and backing board. (See the Exploded View drawing on *page 76.*)

All of these components must fit easily into a rabbet cut into the back of the frame stock. The rabbet must be deep enough to accommodate the combined thickness of the components—at least ⅜"—with additional room to install the retaining brads or glazing points. The rabbet typically measures ¼" wide to overlap and support the glass.

The drawing *below* shows how to determine the overall length of a frame member. Note that the dimensions allow for a 1/16" gap on all sides between the artwork package and the frame. This gap provides room for the artwork package to expand with changes in humidity and assures success during final assembly.

What you use for frame stock depends only on your imagination. Catalogs such as Constantine's (800/223-8087) carry many styles of frame moldings, some of them prefinished. Most home centers carry a variety of architectural moldings that you can adapt by adding a rabbet cut with your router table or tablesaw.

If you would like to make your own stock, check out the eight attractive molding profiles at *left* and *far right.* Then, turn to *pages 77* and *78* to see how simple it is to make each one. Again, all you need are common router bits and a tablesaw. Experiment with other bits to create still more fresh looks.


Mat
Length of frame member
Width of frame less rabbet
1/16" clearance
Length of mat
1/16" clearance
Width of frame less rabbet
Length of member = length of mat + clearances + width of both frames less rabbet

SIZING YOUR FRAME

Anyone?

simple how-to instructions and 8 eye-catching profiles

Cut your miters accurately

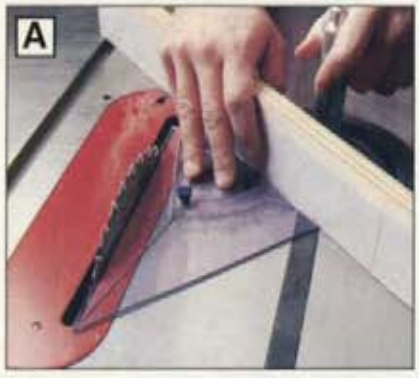
Once you've calculated the frame size, and selected your frame stock, you're ready to cut the miters. You can cut accurate miters on your tablesaw with a simple auxiliary miter-gauge fence and a stopblock. Attach sandpaper to the face of the fence to keep your workpiece from slipping during the cutting process.

First, crosscut your four frame pieces about 1" longer than their finished sizes. Then, use a drafting triangle to adjust the miter gauge to a perfect 45° angle, as shown in *photo A*. Cut the right-hand miter on one end of each frame member.

Use the triangle to reset your miter gauge to make the left-hand cut. Make this cut on one workpiece, still leaving the piece about 1" too long. Hold this miter against a right-hand miter and check for square. If you see a gap between the two pieces, adjust the miter gauge as necessary. Recut the left-hand miter, removing just 1/16" or so of material. Repeat this procedure until the miters mate perfectly.

Using a steel rule, mark one frame member for length as shown in *photo B*. Align the piece to make the cut, then install a stopblock on the fence. Then, cut the piece and the opposing frame member to length without changing your stopblock setting, as shown in *photo C*. Repeat the process to cut equal lengths of the remaining two picture frame members.

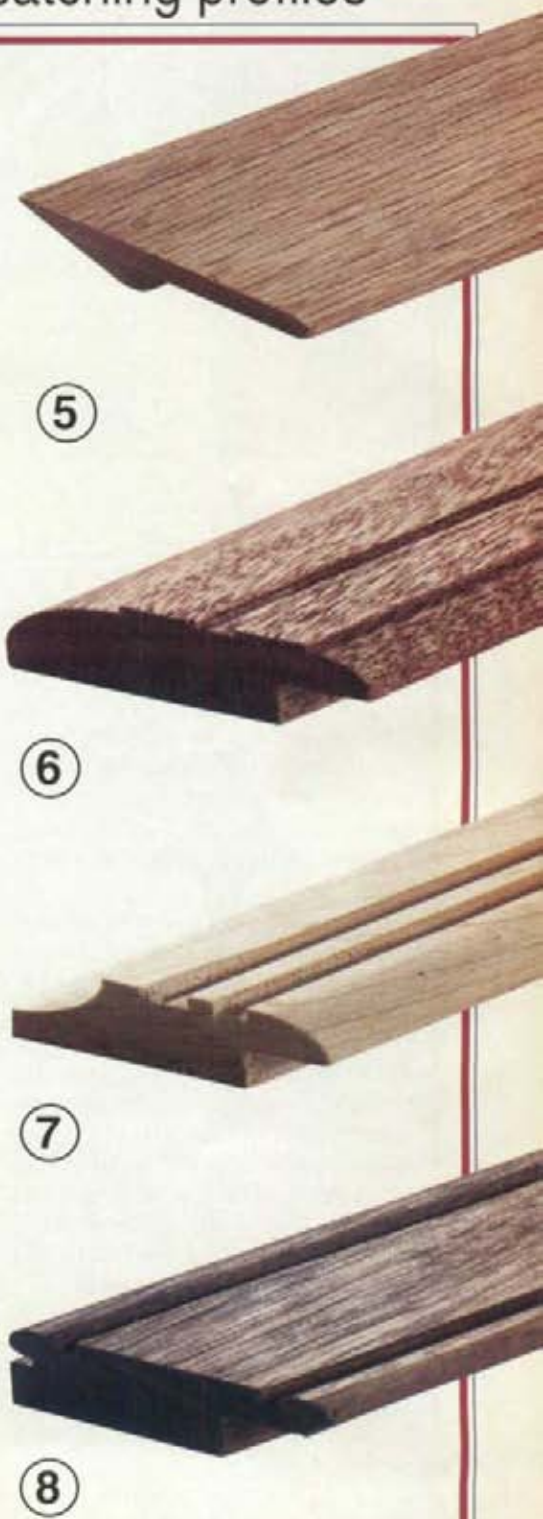
Continued



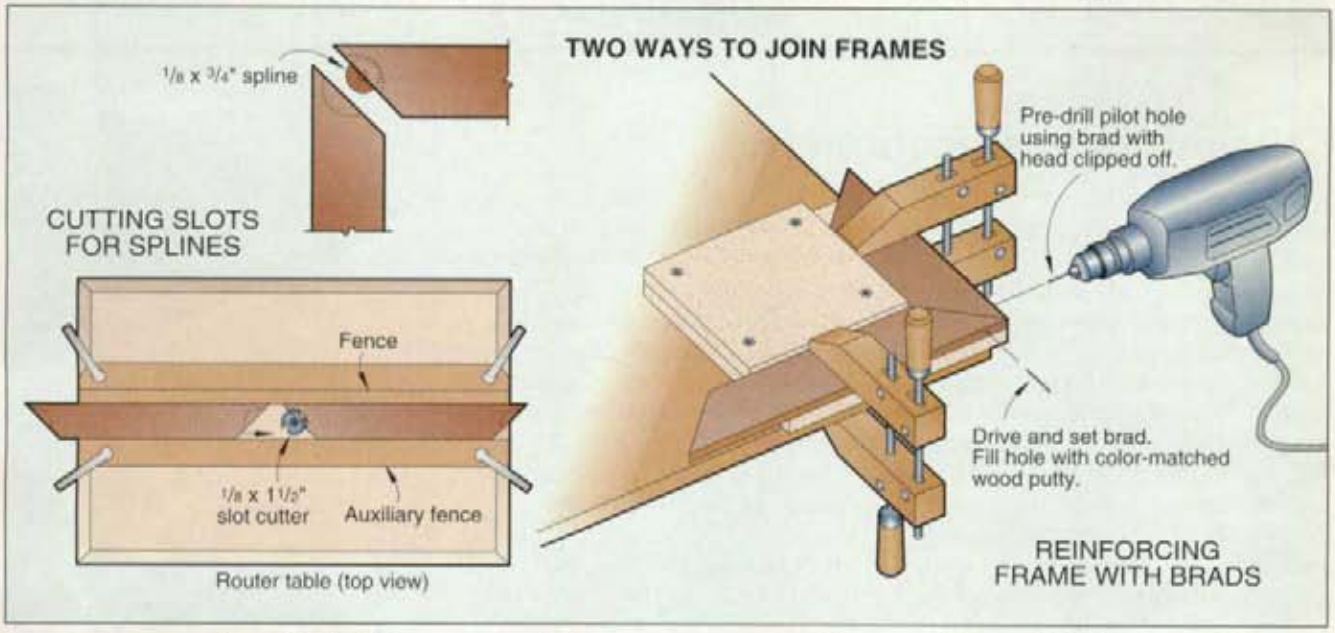
Above: With the blade fully raised and the saw unplugged, use a 45° drafting triangle to set your miter gauge. Note the sandpaper attached to the face of the auxiliary fence helps hold your workpiece in place.

Above right: For accuracy, measure and mark the inside lengths of your frame pieces using a steel rule.

Right: Install a stopblock on the fence to ensure cutting opposing frame members to the same length.



Assemble the frame pieces and add the art package


1/8 x 3/4" spline
CUTTING SLOTS FOR SPLINES
Fence
1/8 x 1 1/2" slot cutter
Auxiliary fence
Router table (top view)
TWO WAYS TO JOIN FRAMES
Pre-drill pilot hole using brad with head clipped off.
Drive and set brad. Fill hole with color-matched wood putty.
REINFORCING FRAME WITH BRADS

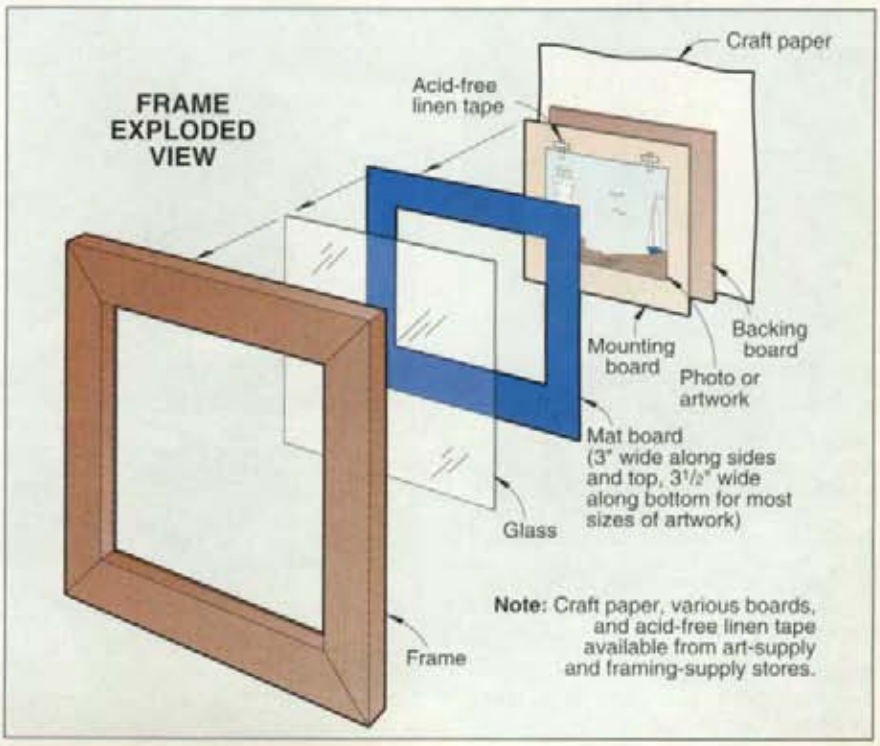
In many cases, glue will hold a small frame together, provided your miters fit tightly. To glue up a frame, apply a thin layer of glue to each miter. Assemble the frame on a flat surface, check it for square, and use a miter clamp or band clamp to hold the pieces in place.

For stronger frames, reinforce the miter joints. Driving a brad into each corner makes a quick, strong solution. Glue and clamp your frame pieces in the jig in the drawing *above*, and check the assembly for square. To prevent the brad from splitting your frame stock, clip the head off an extra brad, chuck it in your electric drill, and use it to make a pilot hole. Drive and set two brads in each corner, then fill.

If you want even stronger joints that resist twisting, consider using splines. The drawing *above* shows how to cut slots for splines using a slotting cutter in a table-mounted router.

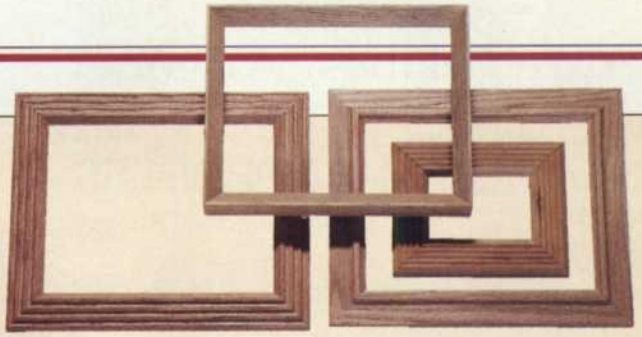
Cutting the slot larger in diameter than the spline gives you some adjustment space when lining up the mating frame surfaces. Cut the splines from ⅛" hardboard using a ¾" holesaw. Apply glue to the slots and miters, then clamp.

Now, add the art package as shown *below*. For more on mounting, see the October 1988 issue, *pages 42-47*. Or, order the back issue by calling 800/572-9350.

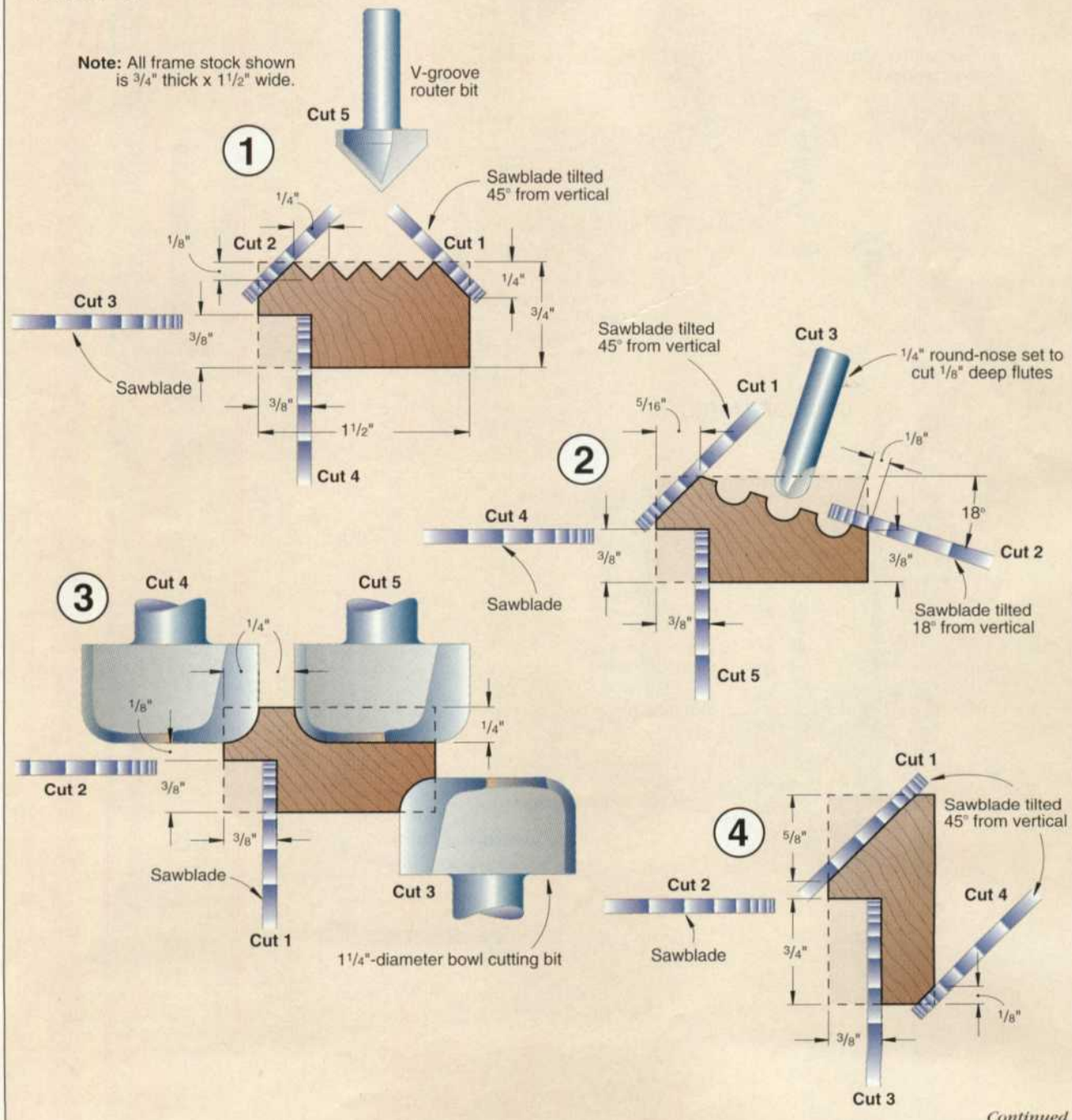

FRAME EXPLODED VIEW
Craft paper
Acid-free linen tape
Backing board
Mounting board
Photo or artwork
Mat board (3" wide along sides and top, 3 1/2" wide along bottom for most sizes of artwork)
Glass
Frame
Note: Craft paper, various boards, and acid-free linen tape available from art-supply and framing-supply stores.

8 EASY-TO-MAKE PROFILES

Making your own molding profiles is as easy as one-two-three. Follow the steps below to craft eye-catching picture frames. See the corresponding numbered profiles on *pages 74 and 75.*



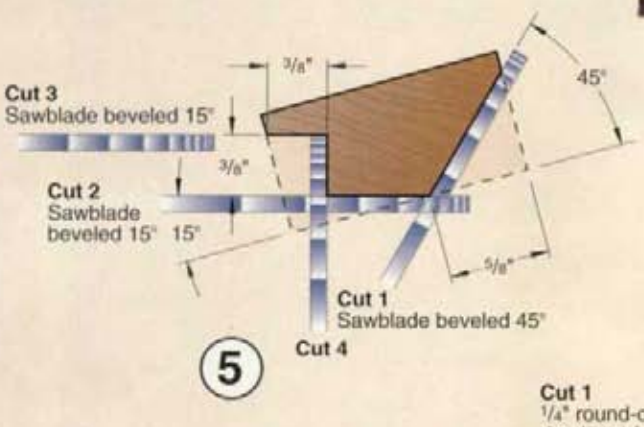
Note: All frame stock shown is 3/4" thick x 1 1/2" wide.

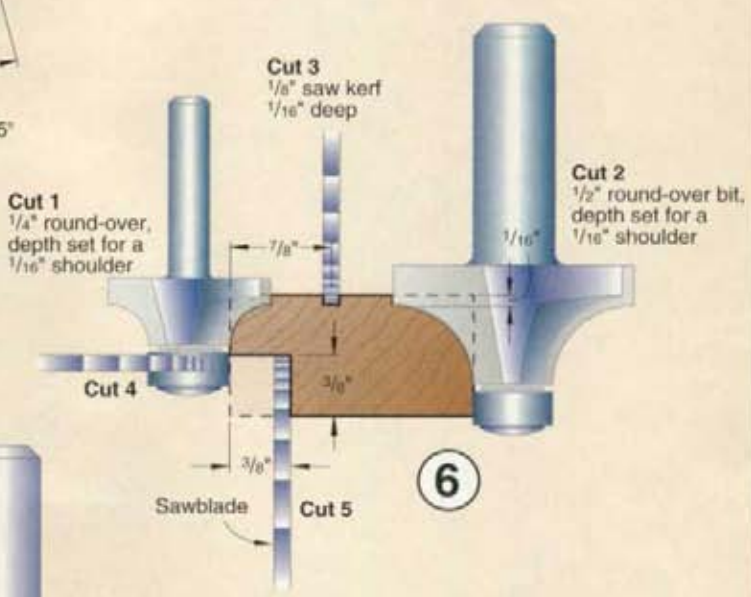


Continued

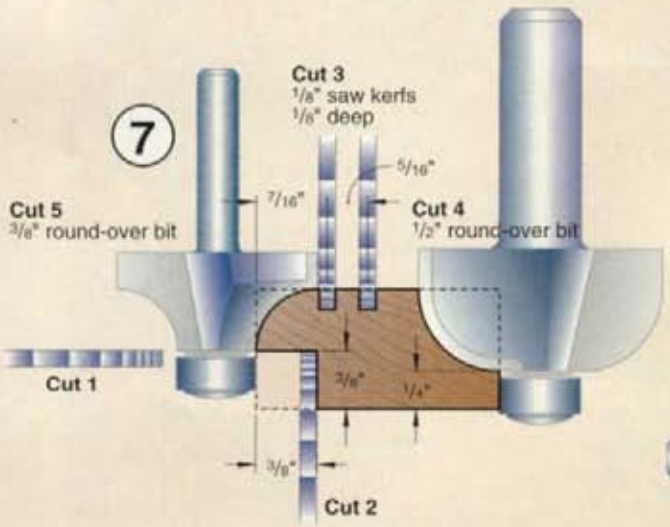
Picture Frames, Anyone?

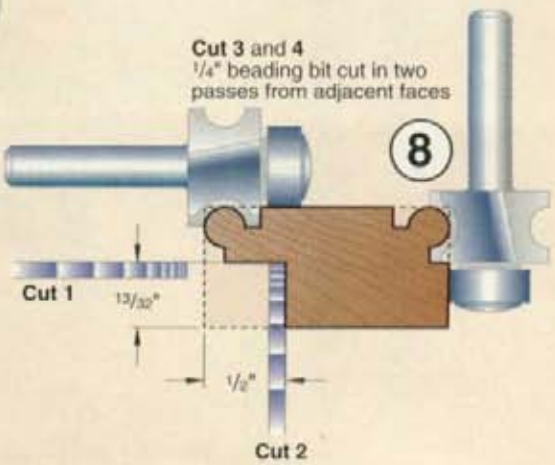
8 EASY-TO-MAKE PROFILES





MORE FRAMES





Photographs: Dean Tanner, Doug Hetherington Illustrations: Roxanne Lemoine

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Item	Style	List	Sale
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Our new Arched Door Pattern Set gives you designs for the four styles shown above on heavy paper stock. You simply trace the outline onto plywood, then cut out your own template set. Includes complete instructions.

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Doormaker's Sets!

Both bits are 1/2" shank, 1-3/4" diameter. Use with 3/4" to 7/8" stock
Raised Panel bits are 1/2" shank, 3-1/8" diameter. Use with 5/8" stock. For 3/4" stock purchase Back Cutter below.

Sets include a Rail & Stile Set, Raised Panel Bit and a hardwood case!

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After Instant Rebate:
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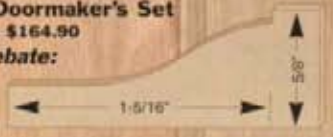

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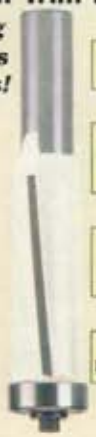

Item	Cutter Diam.	Cutter Length	Overall Length	Price
606-690	3/4"	2"	4"	$39.90
606-691	3/4"	1"	3"	$36.90

Back Cutter Bits

Fit 3/4"-thick door panels fast!

Use these bits after milling the face of your 3/4"-thick door panels.

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609-502	Bevel	1/4"	$39.40	**$28.40**

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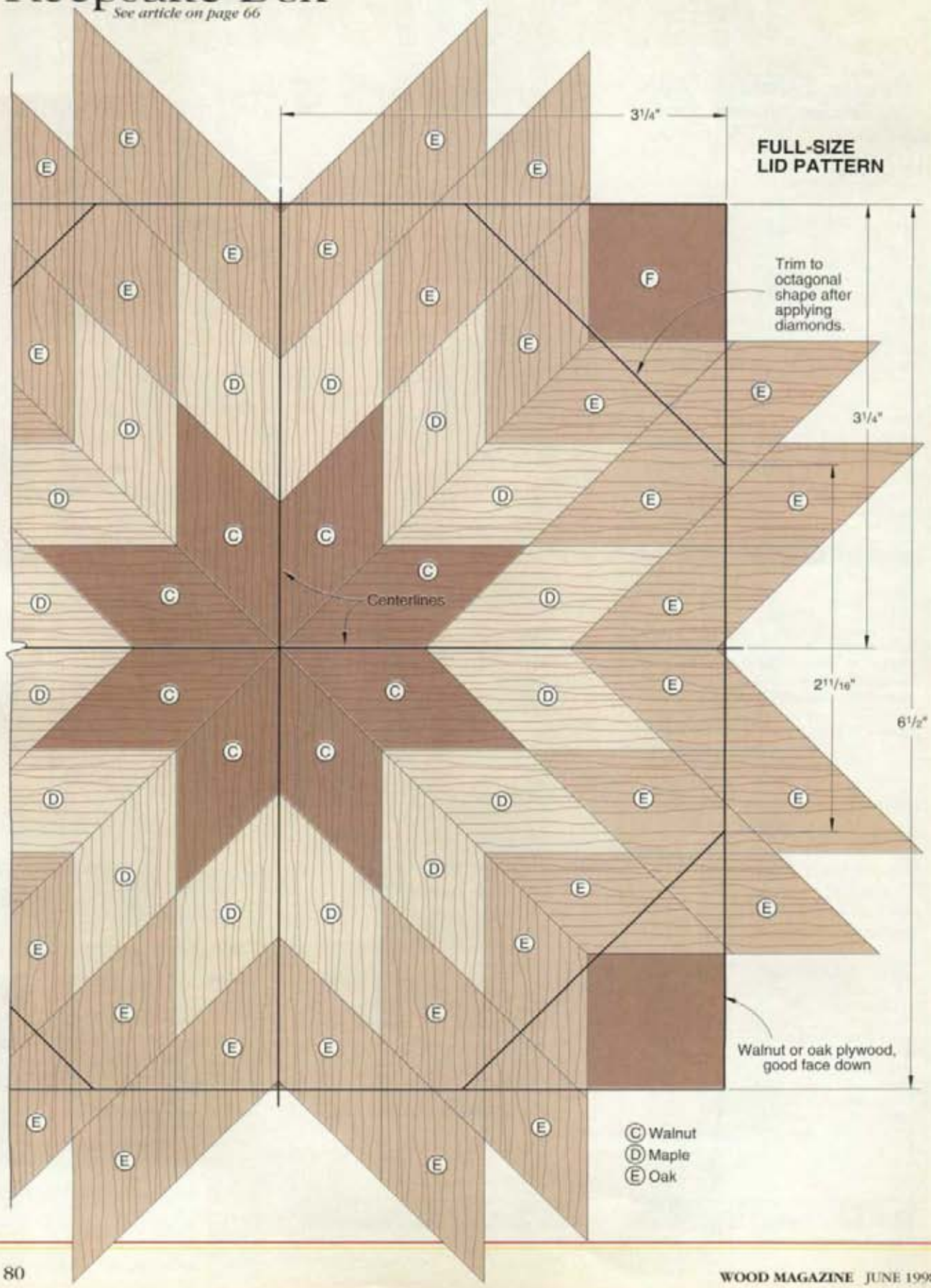
79

Keepsake Box

See article on page 66



A flood isn't the worst thing that can happen to you.

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A flood moves with frightening speed. In minutes, a flood can wash away everything you and your family have spent a lifetime building.

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The truth is, 90% of all natural disasters in this country involve floods. Yet, as many find out too late, most homeowner's insurance policies don't cover flood damage.

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81

This tape measure finds middle without math

One of woodworking's perennial problems involves finding the center of something. I usually have to rely on mental math for this, and it's often the kind that causes a cerebral crash—dividing something like 9⅝" by two.

Here's an easier way: Arm yourself with the CenterPoint 25' tape measure. Then all you have to do to find the center is look at the tape.

A separate scale along the bottom edge of the CenterPoint blade shows exactly one-half the reading on the main scale. So, to find the middle you just note the overall measurement on the regular scale (say 9⅝"), then find the same measurement on the secondary scale. There's the middle.

This supremely handy tape also gives measurements in feet and inches on a scale along the middle of the blade, indicates each foot, and shows 16" centers. I extended the contractor-grade blade past 7' without it drooping. Supporting it with my hand, it made 8½'. I found it easy to engage or disengage the blade lock with my thumb. And the high-visibility yellow ABS case took drops of 4–6' without signs of damage.

If you don't think you need a 25-footer, get the 16' version. With either one of these tapes, you'll always be able to get right to the center of things.

–Tested by Bob McFarlin

PRODUCT SCORECARD

CenterPoint tape measure

Performance	★ ★ ★ ★ ★
Price	25', $16.95; 16', $15.95
Value	★ ★ ★ ★ ★

Baklund-Hellar, Inc., Rt. 1, Box 623, Eastsound, WA 98245. Call 800/540-6604. Available from Woodworker's Store, Woodcraft Supply, Lumberman's, and other retailers.

Black & Decker rotary tools available with or without a cord

With a seemingly limitless array of cutting, grinding, polishing, and sanding accessories available, handheld rotary tools rank high in versatility. Now, Black & Decker's attractive new Wizard rotary tools join this handy category.

The Wizard rotary tools come in two models, the corded variable-speed RT550 and the two-speed cordless VP940. The cordless version of the Wizard runs on a single Black & Decker VersaPak 3.6-volt rechargeable battery.

Both of these new rotary tools feature a keyless chuck and easy-to-engage spindle lock. For most operations, I found finger-tightening the chuck to be adequate. For heavy tasks, such as grinding, an extra twist with pliers secured the bit more satisfactorily.

The cordless VP940 runs at 13,000 or 18,000 rpm, selectable through a top-mounted switch. I found the lower speed useful for delicate work, but the tool stalled easily at that speed. At 18,000 rpm, the VP940 seemed stronger and performed more consistently. I was able to run it 10–12 minutes on a charge; less than the 20-minute run time claimed.

The corded RT550 proved to be the real workhorse in my testing. The tool provided strong torque all across its speed range of 8,000–24,000 rpm. Even aggressive sanding with a coarse drum at the lowest speed didn't strain the RT550. At maximum speed, I found it fast and powerful.

I found both Wizard rotary tools controllable and comfortable to use. For serious work, I recommend the corded RT550. It's powerful, and its run time is unlimited—as long as you keep your electric bill paid up.

The VP940 offers convenience and portability for lighter-duty jobs. (I found it handy for sharpening my chainsaw in the field, among other things.) It would make a great addition to your VersaPak collection.

—Tested by Bob McFarlin

PRODUCT SCORECARD

Black & Decker Wizard VP940 (cordless) and RT550 (corded) rotary tools

Performance (VP940)	★ ★ ★ ☆ ☆
(RT550)	★ ★ ★ ★ ★
Price	VP940, about $30 RT550, about $80
Value (VP940)	★ ★ ★ ★ ☆
(RT550)	★ ★ ★ ★ ★

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Continued on page 100

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334	RO Sander 5" PSA	63
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352VS	3X21 Sander VS	163
360	3X24 Sander w/bag	211
360VS	*NEW!* VS Sander	228
362	4X24 Sander w/bag	217
362VS	*NEW!* VS Sander	236
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697	Router Table &motor	227
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7204	4" RO Sander	109
7518	5 speed 3hp Router	273
7519	3 hp Router	254
7537	2 hp D-Handle RTr	224
7538	3 hp Plunge Router	269
7810	Vacuum	247
9138	Door Planer Kit	234
9045	Sawboxs w/ case	136
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97355	5" RO Sander	144
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3107-1	VS Rt Angle Drill	233
5662	2 Hp Router	164
9020-20	6" RO Sander	153
9025-20	5" RO Sander	134
6101-6	NEW Bandfile	183
6218	Elec. Chainsaw	230
6268	NEW!! Jig Saw	157
6494-6	10" Compound Miter	314
6517-20	New! Quik-Lok Sawzall	154
6537	VS Super Sawzall	174
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1609K	TrimKit	233
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3260DVS	5" RO Sander	99
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DW364	7 1/4" Circ. Saw	161
DW420	5" PSA Rb Sand	78
DW431	3X21 Belt Sander	187
DW443	6" H&L RO Sand	144
DW444	6"PSA RO Sand	144
DW610	1 1/2 Hp Router	149
DW615	1 1/4 Plunge Rtr	166
DW621	2hp Plunge Rtr	217
DW625	3HP Plunge Rtr	277
DW670	Trim Router	96
DW677K	Trimmer Kit	187
DW705	12" Comp Miter	394
DW938	14V Cordls Saw	158
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4305	Jig Saw	156
6213DWAE	3/8" 12V Cordl	178
6233DWAE	3/8" 14V Cordl	198
6313DWAE	1/2" 12V Cordl	196
6333DWAE	1/2" 14V Cordl	213
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LS1030	10" Miter Saw	199
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36-090	Sliding 10" Miter Saw	218
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40-660	16" Scroll Saw	159

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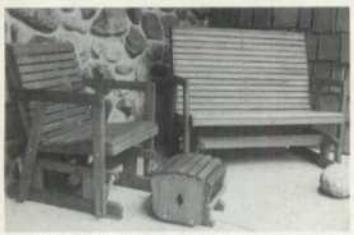

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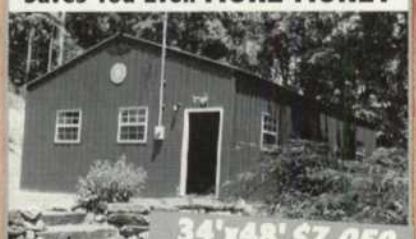

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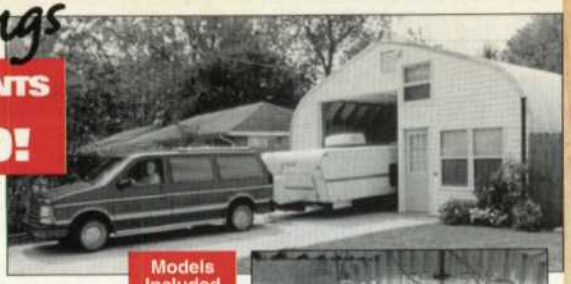

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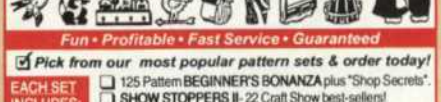

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Published by Popular Woodworking
Author – Jim Tolpin

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With this one ALL PURPOSE blade you can RIP & CROSSCUT 1"–2" ROCKHARDS and SOFTWOODS resulting in a **SMOOTH AS SANDED** surface. PLY-VENEERS of OAK and BIRCH will crosscut with NO BOTTOM SPLINTER at moderate feed rates.

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5/8" holes, boring thru 1-1/4" add $7.50. Larger or Time Bore. —Shipping $4.50

WOODWORKER II	LIST	SALE	10%	20%
14"X40TX1"	$215	$149	$134	$119
14"X30TX1"	$195	$139	$125	$111
12"X40TX1"	$183	$129	$116	$103
12"X30TX1"	$162	$119	$107	$ 95
10"X40TX1/8" or 3/32"	$156	$119	$107	$ 95
30T 1/8" or 3/32"	$135	$ 99	$ 89	$ 79
9"X40T	$146	$109	$ 98	$ 87
30T	$125	$ 99	$ 89	$ 79
*8-1/4"X40TX 3/32"	$136	$ 99	$ 89	$ 79
8"X40T 3/32"	$138	$ 99	$ 89	$ 79
30T	$115	$ 89	$ 80	$ 71
7-1/4"X30T 3/32"	$112	$ 69	$ 62	$ 55
**6"X40T 3/32"	$136	$ 89	$ 80	$ 71

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C-4 Carbide Tips — 4 on each chipper with special negative face hooks. Shims & 3/32" Chipper. Cuts 1/8" to 29/32" wide!!

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6" D. 5/8" Bore NEW	$299	$269	$242	$229
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10" D. 5/8" & 1" Bore	$389	$349	$314	$297
12" D. 1" Bore	$499	$449	$404	$382

(Bore up to 1-1/4" Add $25 — Plus $5.50 S&H)

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Fine Woodworking Magazine test Oct. '96 page 43

Editors' Choice and Top Rating over 18 competing combo saw blades!

"The 10"x40T earns our Editors' Choice award for the best performance, regardless of price. The 10"x40T produced super-smooth ripped edges in ¾ in. pine and oak, with absolutely no saw marks visible to the eye...we also got excellent crosscuts, surpassed only by an 80-tooth dedicated crosscut blade." See *American Woodworker* April 1998, pp. 64-69.

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New specs, 5° Neg. Pts. & flat, runs out less than .002 for perfect, tight, smooth, splinter-free miter joints. **TAKE EXTRA 10% – 20% OFF COMBO SALE!**

NEW SIZES AVAILABLE	LIST	SALE
Delta Sidekick 8-1/2"x40Tx5/8"	$149	$ 89
Sears 8-1/4" & Delta 8-1/4"x60Tx5/8"	$170	$ 99
Hitachi 8-1/2"x60Tx5/8"	$179	$109
DeWalt 8-1/2" & Ryobi 8-1/2"x60Tx5/8"	$179	$109
Delta 9"x80Tx5/8"	$204	$119
Ryobi–Makita & all 10"x80Tx5/8"	$207	$129
DeWalt, Makita, B&D, Hitachi 12"x80Tx1"	$229	$139
Ryobi–Makita 14"x100Tx1"	$266	$179
Hitachi 15"x100Tx1"	$277	$189

For good general purpose cuts use Woodworker II 30T & 40T or Woodworker I. Use small stiffener where possible.

THE ONE BLADE THAT LEAVES A SMOOTH-AS-SANDED SURFACE!

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WOODWORKER I – CROSSCUT — 7 1/4" – 14"
For TABLE and RADIAL SAW – 10% to 20%

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	LIST	SALE
14"x60Tx1"	$224	$159
12"x60Tx1" or 5/8" 1/8"K	$198	$139
10"x60Tx5/8" 3/32"K	$162	$129
8-1/4"X60T	$150	$109
8"X60T	$150	$109
7-1/4"X60T	$150	$109

OTHER SIZES AVAILABLE – 7 1/4" – 14"

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220mm x 80T x 1/8" x 30mm	—	$167
9" x 80T x 1/8" & 3/32" K	$207	$179
10" x 80T x 1/8" & 3/32" K	$207	$159
12" x 80T x 1-1/8"K	$212	$181

SIZES AVAILABLE	LIST	SALE
300mm x 100T x 1/8" x 30mm	—	$197
12" x 100T x 1-1/8"K	$253	$215
14" x 80T x 1"	$232	$197
14" x 80T x 1"	$266	$226
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Whether you're fixing up indoors or out, adding a new space or face-lifting the old, your ideas and efforts may rate a top award – and a feature in our magazine!

PICK YOUR PROJECT

Two Categories – Twelve Divisions

You can win one of three cash awards in any of 12 divisions (eight Remodeling and four Decorating) plus a Grand Prize and two Runners-Up.

CATEGORY I - REMODELING

(Primarily structural home improvements. Awards for Class A – large, Class B – medium, and Class C – small projects.)

- Exterior Fix-Ups
- Outdoor Improvements
- Kitchen Shape-Ups
- Bathroom Remodeling
- Interiors
- Additions
- Whole-House
- Restorations

CATEGORY II - DECORATING

(Solely cosmetic changes to your home's interior. Awards for First, Second, and Third Place projects.)

- Special Spaces: Child's room, home office, porch, and sunroom
- Public Rooms: Living room, family room, kitchen/great-room, formal and informal dining area, and entryway
- Private Rooms: Master bedroom, master bath, guest room, and bathroom
- Whole House Redecorating: Cosmetic changes to most of the major rooms in the house

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Best of Contest: $10,000 PLUS a 7-Day Vacation for Two at the Radisson Cable Beach Resort, Nassau, Bahamas. Airfare included.

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Two Runners-Up: $4,000 each

CATEGORY I - REMODELING

Twelve awards given in each of the eight divisions:

Class A:	**$1,500**
Class B:	**$ 750**
Class C:	**$ 300**

Three merit winners in each class: $100
(Projects are classed by the scope of the effort.)

CATEGORY II - DECORATING

Three awards in each of the four divisions:

First Place:	**$1,500**
Second Place:	**$ 750**
Third Place:	**$ 300**

We'll judge your entry on how good it looks, how well it works, and how much value you got for the money you spent. Any home improvement/decorating project completed in 1998 is eligible, no matter how big or small it is or when it was started. It's also eligible whether you did all the work yourself or hired professional help. Entrants must be U.S. residents, 18 years of age or older. Judges' decisions are final. Void where prohibited.

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HOW TO ENTER

1. RIGHT NOW: Complete and mail the preliminary entry blank on the following page, or send a photocopy, by November 2, 1998. We'll send you complete details and entry materials, along with our official entry form.

2. WHEN YOUR PROJECT IS DONE: Send us the final entry form. (Get a head start now by saving floor plans, before and after photos, and receipts that could make your project a winner.) All final entries must be postmarked by February 1, 1999.

3. THE WINNERS: *Better Homes and Gardens®* will select its winners on or about June 1, 1999. We will notify winners by mail and publish a selection of the top winners in upcoming issues.

WIN ADDITIONAL PRIZES

You might also win cash, products, or product purchase refunds from cosponsoring manufacturers whose products you've chosen to incorporate into your project. *Please turn the page for additional prizes and entry form.*

Better Homes and Gardens®/NAHB Remodelors™ Council Home Improvement Contest

S P E C I A L A W A R D S

$500 CASH AWARDS*

Following is a list of cosponsors providing $500 for best use of product.

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Armstrong World Industries
Broyhill Furniture Industries, Inc.
Clopay Garage Doors
DuPont Corian®
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Sunbrella® Fabrics by Glen Raven Mills, Inc.
Thomasville Furniture Industries

DON'T MISS OUT ON THESE SPECIAL AWARDS*

The following manufacturers are offering special prizes in addition to a $500 cash award.

Cosponsor Manufacturers Special Awards

Andersen® Windows and Patio Doors will give an additional $500 cash award to one winner selected from each of the following categories: Kitchen Shape-Ups, Additions and Whole-House, who used Andersen® Windows or Patio Doors in a significant way.

Broyhill Furniture Industries, Inc. will award $2,500 (retail value) of Broyhill furniture for the best use of Broyhill furniture.

Hunter Douglas will award $500 to any Class A and First Place winner who uses one of the following products. They will reimburse the cost of the product as well: Silhouette® window shadings, Vignette® window shadings, Luminette Privacy Sheers®, Duette® honeycomb shades or Lightlines™ miniblinds.

Kohler Co. will award an additional $1,500 to any Class A, B or C winner in the Bath Division who uses a Bodyspa (3.6 or 10 jet system) and $300 to the top winner in the Kitchen Division who uses a Kohler Cast Iron sink and an Avatar pull-out kitchen faucet.

Lane Reclining Furniture and Sleep Sofas will award one recliner with a retail value of up to $1,000 for the top winner of the Whole House Redecorating Division, when proof of purchase of Lane furniture is provided.

Merillat Industries will award a cash reimbursement for the exclusive use of Merillat or Amera Cabinetry to the Class A winner in each of the following categories: Kitchen Shape-Ups ($5,000 maximum reimbursement) and Bathroom Remodeling ($2,000 maximum reimbursement).

Minwax Company will award an additional $500 cash prize for best use of a Minwax product on a new, previously unfinished piece of furniture.

AND MORE ...

Special Home Furnishings Council Prizes*

(Details on the following provided in your entry packet.)

- $3,000 Home Furnishings Council Award to the winner of "Why My Home is My Haven" Essay Contest
- $1,000 Home Furnishings Council Award to any winner who uses products from a manufacturer member as a substantial part of his/her decorating project

Farmers Insurance Company, the Official Insurance Company of the 1998 *Better Homes and Gardens*®/NAHB Remodelors™ Council Home Improvement Contest, will provide a free copy of the *Better Homes and Gardens*® *New Cook Book* (retail value $24.95) to all entrants who have Farmers Insurance coverage for their automobile or home.

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* These prizes are void in Arizona, Maryland, North Dakota and Vermont.

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PRELIMINARY ENTRY BLANK

Must be postmarked no later than November 2, 1998

Send $3.00 for shipping and handling to:

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P.O. Box 14494, Dept. WD2
Des Moines, IA 50306-3494

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Check the project(s) you plan to complete in 1998.

REMODELING CATEGORY

- ☐ 1. Exterior Fix-Ups
- ☐ 2. Outdoor Improvements
- ☐ 3. Kitchen Shape-Ups
- ☐ 4. Bathroom Remodeling
- ☐ 5. Interiors
- ☐ 6. Additions
- ☐ 7. Whole-House
- ☐ 8. Restorations

DECORATING CATEGORY

- ☐ 9. Special Spaces: Child's room, home office, porch, and sunroom
- ☐ 10. Public Rooms: Living room, family room, kitchen/great-room, formal and informal dining area, and entryway
- ☐ 11. Private Rooms: Master bedroom, master bath, guest room, and bathroom
- ☐ 12. Whole House Redecorating: Cosmetic changes to most of the major rooms in the house

(Please Print)

Name_____

Address_____

City_____

State_____ Zip_____

Allow six weeks for delivery of final entry packet. The $3.00 S&H charge is waived for residents of AZ, MD, ND, and VT.

Please do not send photos or project plans with this preliminary entry form. Send only one preliminary entry blank per family. See page 101 for complete rules.

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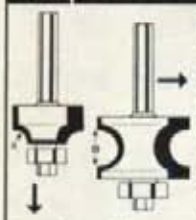

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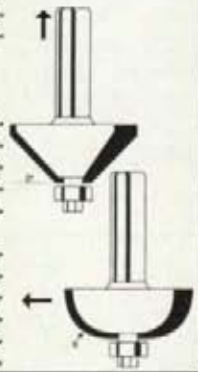

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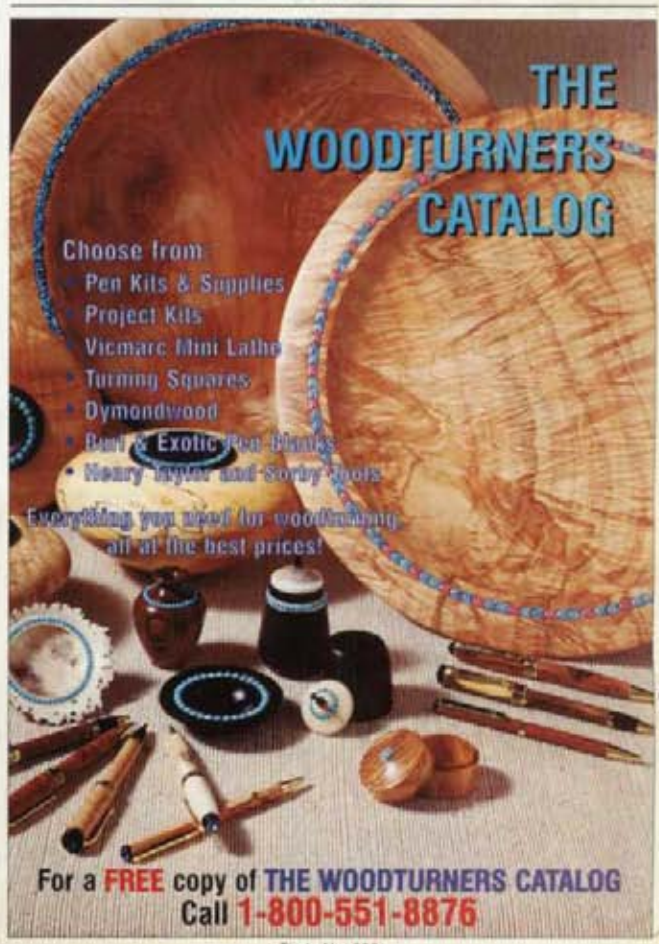
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DRILL MASTER

115 PC. TITANIUM NITRIDE COATED DRILL BIT SET

These bits last up to six times longer than standard bits, they penetrate 75% faster, cut more freely so you use less power, and they don't expand with heat, so you get properly sized holes. All bits can be sharpened. Includes: 29 fractional sizes 1/16" through 1/2" by 64ths; 26 letter sizes A through Z; 60 numbered sizes 1 — 60; Heavy duty metal drill index

ITEM 01611-1KSA ~~$69.99~~ $49.99

29 PC. TITANIUM NITRIDE COATED DRILL BIT SET ~~$26.99~~

Sizes: 1/16" — 1/2" by 64ths; Steel index box

ITEM 05889-5KSA $19.99

CHICAGO Electric Power Tools

18V CORDLESS 5-3/8" CIRCULAR SAW KIT

Cut up to 85 ft. of plywood on a single charge. Kit includes: 1 hour quick charger, 18 volt battery, saw and hex key. 3000 RPM; 1.3 amps; 10mm arbor; 60° bevel capacity; maximum depth of cut @ 90°: 1-1/2", @ 45°: 1-1/4", weighs 7-1/2 lbs.; blade & rip fence sold separately

ITEM 37412-3KSA $89.99

5-3/8" TUNGSTEN CARBIDE TIP BLADE

Teeth: 24; C2 carbide steel; Arbor: 10mm; Maximum RPM: 7000

ITEM 37413-0KSA $7.99

18 VOLT REPLACEMENT BATTERY

ITEM 37145-1KSA $29.99

CENTRAL MACHINERY

13 GALLON INDUSTRIAL PORTABLE DUST COLLECTOR

Develops over ten times the suction of most shop vacuums. Flexible 4" PVC hose will last for years and is sized to pick up large chips from jointers, saws, shapers and planers. Heavy duty ball bearing castors. Hose sold separately.

Bag capacity: 13 gallon; Motor: 110V, 7 amp, 1 HP; Hose inlet: 1; CFM: 660

ITEM 31810-4KSA ~~$139.99~~ $119.95

CENTRAL MACHINERY

SAVE $50.00

3/4 HP MOTOR INDUSTRIAL 1/2" REVERSING WOOD SHAPER

Cut your finish sanding time 50% or more with this top quality reversing 1/2" shaper. The powerful 3/4 HP motor drives the cutters at 9000 RPM. Each half-fence is independently adjustable.

- Table: 15-1/2" x 18", finish ground with miter slot • Fence: 2-3/4" x 11" each
- Motor: 3/4 HP, 110 volt, single phase
- Spindle adjustment travel: 7/8"
- Spindle diameter: 1/2"
- Shipping weight: 137 lbs.

ITEM 06851-2KSA $199.99

CENTRAL PNEUMATIC CONTRACTOR SERIES

Similar to Senco LS4

18 AND 19 GAUGE AIR FINISH NAILER

Easy-to-use in tight spots. Loads up to 105-18 gauge brads to get more done with less down time. Uses 5/8" to 1-3/16" brads.

- Air consumption: 3.5 CFM at 75 PSI
- 1/4" NPT inlet

ITEM 36618-5KSA ~~$36.99~~ $29.99

18 GAUGE BRADS (PKS. OF 5000)

LENGTH	ITEM	PRICE
1"	33206-1KSA	$5.99
1-3/16"	33207-2KSA	$6.99

HITACHI

Hitachi C10FC

COMPOUND MITER SAW

- Powerful 15 amp motor
- 10 positive miter stops 15°, 22.5°, 30°, 45° left and right, 0°, and 60° right
- Dust collection
- Includes electric brake

ITEM 35249-3KSA $179.99

A. LASER LEVELER

Compact high leveler projects a round dot visible up to 600 feet away. Solid brass construction. Built-in spirit (bubble) level. Locking on/off switch.

- 4-1/4" long x 3/4" diameter

ITEM 36535-2KSA $49.99

B. HI-OUTPUT LASER POINTER

Make sure people get your point. Perfect for supervisors, teachers, product demonstrators.

- Includes two AAA batteries
- 5-1/2" long

ITEM 37431-2KSA $14.99

CHICAGO Electric Power Tools

LIMITED QUANTITIES

4-1/2" DISC GRINDER

- 5/8"-11 spindle with 7/8" arbor adapter
- High powered 10,000 RPM
- Motor: 3/4 HP, 115V, 5.18 amps
- Spindle lock
- 11-7/8" long

ITEM 36158-1KSA $19.99

4-1/2" x 1/4" GRINDING WHEELS FOR METAL PK. OF 10

- 24 grit, 7/8" arbor

ITEM 06674-0KSA $8.99

LANCELOT 22 TPI CARVING DISC

Carve, sculpt and cut wood in any direction.

- Fits 4" & 4-1/2" grinders with 5/8" arbor

ITEM 07697-3KSA $27.99

CENTRAL MACHINERY

FREE ACCESSORIES: STAND, 6" BELT, 9" DISC, OPEN-END WRENCH, AND HEX-KEY WRENCH

COMBINATION 6" x 48" BELT AND 9" DISC SANDER

Sanding power! Get the option of belt or disc in one machine. Very versatile – two position worktable adjusts between 0° and 45° for belt or disc.

1HP, 110V, 8 amps; 3450 RPM, all ball bearing motor; Overall height: 40"; Table surface: 6-1/2" x 12-3/4"; Easy tension adjustment; Weight: 121 lbs.; Disc speed: 1720 RPM; Belt speed: 1280 FPM

ITEM 06852-9KSA $172.99

CENTRAL MACHINERY

5 SPEED BENCH DRILL PRESS

- 2" stroke, 8-1/4" swing
- Speeds: 620, 1100, 1720, 2340 and 3100 RPM
- 1/3 HP motor moves at 1720 RPM
- Table: 8-1/4" square • 1/2" chuck
- 8-1/4" maximum distance spindle to table
- 22-1/2" high, 47 lbs.

ITEM 05901-0KSA ~~$59.99~~ $48.99

DRILL PRESS WITH KEYLESS CHUCK

- No more lost chuck keys

ITEM 34231-6KSA ~~$69.99~~ $49.99

DEWALT

LIMITED QUANTITIES

DeWalt DW952K-2R

INCLUDES FREE EXTRA BATTERY

3/8", 9.6 VOLT VSR CORDLESS DRILL KIT

- Dual range reversible 0-400/0-1100 RPM
- Adjustable clutch torque control
- Equipped with a keyless chuck and an electric brake • Shipping wt.: 11-3/4 lbs.
- Includes: 1 hour charger, TWO batteries, heavy duty carrying case, and a double ended screwdriver bit
- Factory reconditioned, factory perfect

ITEM 51587-3KSA $79.99

CHICAGO Electric Power Tools

TRIM ROUTER

Now you can tackle those jobs that were too fine or exacting for a standard router. This compact router weighs only 4 lbs. for easy operation. Includes a straight and adjusting conductor to assist in trimming and engraving in both straight and circular patterns.

98

- 8-1/2" overall length
- [illegible] maximum amp draw
- [illegible] no load speed
- 4 lbs. [illegible] weight

ITEM 33833-3KSA $39.99

4102

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CHICAGO Electric Power Tools

3/8", 14.4V CORDLESS DRILL KIT
W/KEYLESS CHUCK

High voltage, heavy duty battery gives long run times between charges. T-Handle design makes this drill easy to use.
- Includes 6 pc. drill bit set, 6 pc. screwdriver bit set, magnetic extension bit, charger, battery, keyless Jacobs® chuck, and carrying case
- Variable speed, reversible; 0 to 600 RPM
- 6 torque settings: 13-300 in. lbs.

~~$69.99~~ **$39.99**
ITEM 34793-2KSA

14.4V BATTERY
ITEM 34794-0KSA **$29.99**

CENTRAL MACHINERY

DRILL 1/4", 3/8", & 1/2" SQUARE HOLES

MORTISING MACHINE

Make a square hole in the fraction of the time it takes by hand! Easier layout for professional mortise and tenon joints in furniture, cabinets, and restoration. Fence with hold down clamp keep workpieces from lifting off the table. Large capacity - up to 5" maximum height. Includes fence, workpiece clamp, and 1/4", 3/8", and 1/2" mortising chisels and bits.
- 10-7/8" x 7-3/4" base • 13-3/8" x 6" table
- 3580 spindle speed • 60 lbs. shipping wt
- 5" max. workpiece height • 3" throat
- Accepts .745" chisel shanks
- 1/2 HP, 110V, 2.3 amps

~~$169.99~~ **$149.99**
ITEM 35570-5KSA

CENTRAL MACHINERY

4" x 36" BELT/ 6" DISC SANDER

Adjustable belt sands inside and outside curves. Cast aluminum sanding disc features a cast aluminum table that locks in any angle from 0° to 45°. Table can be repositioned for use with belt or disc.
Includes: 7-1/2" x 5" cast aluminum table, miter gauge, and adjustable backstop; 4000 FPM belt speed; 1725 RPM disc speed; 1/3 HP, 1725 RPM, 115V, single phase.

LIMITED QUANTITIES
~~$79.99~~ **$59.99**
ITEM 05154-6KSA

SANDING BELT CLEANER
- Increase the life of your sanding belts and discs up to 500%
- 8-1/2" x 1-1/2" x 1-1/2"

ITEM 30766-0KSA **$3.99**

DELTA®
Delta 22-560K

LIMITED QUANTITIES

12-1/2" PORTABLE PLANER

Get smooth, even cutting and superior snipe control adjustment with this 2-knife cutter head. Quick change, high speed steel double-edged/reversible knife system requires no radius gauge for setting. Easy-to-read SAE/metric scale. Includes carrying handles & infeed/outfeed tables.
- Motor: 15 amp, 120V, 60 Hz, single phase
- Capacities: 12-1/2" width, 6" thick, 1/8" maximum depth of cut
- Feed rate: 26.2 FPM
- Cutter head speed: 8000 RPM
- Table size w/extensions 12-1/2" x 23-5/8"
- Improved dust exhaust system
- Factory reconditioned, factory perfect

ITEM 51706-1KSA **$329.99**

CHICAGO Electric Power Tools

VARIABLE SPEED

RECIPROCATING SAW

- Gear driven, variable speed • 3.6 amps
- 300 SPM to 2400 SPM • 1-1/4" stroke
- All ball bearing • Overall length: 17"
- 110V, 60 Hz, single phase • 600 Watts
- Tool weight: 7-1/4 lbs.

ITEM 36595-2KSA **$59.99**

BI-METAL SAWZALL® BLADES
- 18 teeth per inch, 6" length **5 PACK**
- 1/2" universal shank

Milwaukee 48-01-1184
ITEM 03323-4KSA **$9.99**

RECIPROCATING SAW BLADES
- 5 metal cutting 18 TPI, 5 wood cutting 6 TPI
- 1/2" universal shank

ITEM 06467-0KSA **10 PACK** **$5.99**

CENTRAL MACHINERY

16" SCROLL SAW

- Precision milled 14-1/2" x 8" table tilts 0° to 45° • 1/8 HP, 110V, .83 amps
- Uses pin end blades, 5-1/2" long
- Heavy duty cast iron frame and base reduce vibration • 7/8" blade stroke
- 1750 SPM blade speed

REDUCED! **$55.99**
ITEM 36392-3KSA

5 PC. 5-1/2" SAW BLADES
- Pin end type

ITEM 35024-0KSA **$4.99**

Pittsburgh®

LIFETIME WARRANTY

5 PC. 8 TO 32 OZ. BALL PEIN HAMMER SET

LIMITED SUPPLIES

High quality alloy steel heads with tempered striking faces. Extra strength hardwood handles. This set includes all the most popular sizes for just about any job: striking chisels and punches, for riveting, and for shaping and straightening unhardened metal.
- Contains 8, 12, 16, 24, and 32 oz. hammers

~~$9.99~~ **$6.99**
ITEM 36523-2KSA

QUANTITES LIMITED

PORTABLE CLAMPING WORK TABLE

Four swivel pegs adjust to handle a wide variety of clamping jobs. Folds compactly away for easy storage. All steel construction.
- 24" wide top • Non-skid feet
- Supports up to 220 lbs.

~~$29.99~~ **$19.99**
ITEM 34179-1KSA

DELTA®
Delta 36-220

LIMITED SUPPLIES

10" COMPOUND MITER SAW

2-1/2 HP, 15 amp motor. D-handle with trigger switch for positive control. Electric brake automatically stops blade in seconds. Includes dust collection bag, 10" blade with 5/8" arbor, and retractable blade guard.

Blade speed: 4900 RPM @ no-load. Capacities: 2-3/4" x 5-3/4" crosscut, 2-3/4" x 4-1/8" 45° right & left miter, 1-3/4" x 5-3/4" 45° left bevel, 1-3/4" x 4-1/8" 45° x 45° compound. Table diameter: 10-1/2". Tool weight: 60 lbs. Factory reconditioned, factory perfect.

~~$175.99~~ **$155.99**
ITEM 06125-3KSA

CENTRAL MACHINERY

10", 2 HP, BENCH TABLE SAW

Die cast aluminum table 25-3/4" x 16", has adjustable 17-7/8" x 2" rip fence and inch/metric scale for precise cutting. Blade adjustments control angle and depth of cut.
- Maximum depth of cut at 90°: 3-1/8", at 45°: 2-1/2" • Shipping weight: 36 lbs.
- Miter gauge adjusts 0° - 60° left and right
- Motor: 2 HP, 115V, 60 Hz, 10 amp, 4500 RPM • Blade capacity: 10" w/ 5/8" arbor
- Blade sold separately, see below

$79.99
ITEM 35715-2KSA

10", 80 TPI, CARBIDE TIPPED CIRCULAR SAW BLADE
- Heat-treated, surface ground body for smooth cutting
- 5/8" arbor, 9000 RPM

ITEM 36115-3KSA **$14.99**

DRILL MASTER

TiN COATED FORSTNER BIT SETS

Titanium nitride runs cooler, cuts easier, and lasts longer than standard steel! Includes 3/8" shanks and individually organized wooden case. Rockwell hardness range from 55-65 HRC.

20 PC. SET
- 20 sizes from 1/4" to 3/4" by 16ths, 7/8", 15/16", 1" to 2" by 8ths

ITEM 31130-7KSA **$34.99**

16 PC. SET
- 16 sizes from 1/4" to 2-1/8" by 8ths

ITEM 32404-8KSA **$29.99**

CENTRAL MACHINERY

- **VARIABLE SPEED**
- **BIG 12" THROAT**
- **3/4 HP**

12" BANDSAW

Precision throw-wheeled design cuts material up to 12" wide and makes bevel cuts from 0° to 45°. Electronic variable speed from 0 to 2645 feet per minute. Includes miter gauge. Blade sold separately, see below.

Table: [illegible] aluminum; 13-1/2" x 13-1/2"; Work [illegible] x 4-5/8"H; Requires 62" blade; Overall dim.: 25"L x 13-1/2"W x 23-3/4"H; Shipping wt.: 32 lbs.

~~$116.99~~ **$99.99**
ITEM 01629-1KSA

BANDSAW BLADE
- 6 TPI

ITEM 31236-5KSA **$4.99**

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Continued from page 82

All for one, one biscuit joiner for all

Finally, somebody came up with one biscuit joiner that cuts slots for every size biscuit—even the small biscuits used for narrow stock. While a 4" blade is standard on other biscuit joiners, the new Porter-Cable 557 Plate Joiner is the only one I've seen that comes with both 2" and 4" cutters. Using the 2" cutter and P-C's smaller "FF" (1¼") biscuits, I joined 1½" stock, such as you'd use in a cabinet face frame, with no trouble.

With the rotating preset depth stops, you can quickly change the depth of the slot for sizes FF, 0, 10, and 20 biscuits. You'll also find presets for full-depth cuts, and biscuit-size hinges and knockdown hardware.

The unusual fence design on the P-C 557 biscuit joiner makes it easy to cut biscuit slots, even on a mitered edge. The bottom scale of the unique two-level fence guide has markings from 0 to 90°, with positive stops at both extremes. For angles from 90 to 135°, just slide the fence-locking mechanism through to the top scale. With the fence in the 135° position, I captured the 45° miter in the vee of the fence and cut perfect slots as shown *right*. And, the fence folds flat so you don't need to remove it to make cuts on the surface of a workpiece.

Don't skip the safety glasses when cutting slots, though. Chips and dust can blow straight up into your eyes driven by air from the left exhaust port. Porter-Cable has promised to correct that problem.

—Tested by Dave Henderson

PRODUCT SCORECARD

Porter-Cable 557 Plate Joiner

Performance	★ ★ ★ ★ ☆
Price	Mail order price $238
Value	★ ★ ★ ★ ★

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- Great fit
- No changing bits.
- No reversing the pieces.
- Just raise, cut—that's all!

only $49.
For your Shaper 3/4" Bore $89. 1-1/4" Bore $99.

Our PANEL RAISER WITH UNDERCUTTER, 5 profiles available: Ogee, Convex, 12° Face Cut w/Qtr, Rnd., Traditional, Wave. Dressed with a heat-resistant, super slick finish. Always makes just the right tongue thickness to perfectly match the groove in your Rail & Stile-everytime-what could be easier!!

only $49.
3/4" Bore or 1-1/4" Bore Shaper Cutter Panel Raiser only $59.

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Best Prices, Best Selection, Top quality!

NEW Don't throw those "shorts" away! Now an affordable router bit FINGER JOINER WL-1429 only $39.
For the Shaper WL-1580 was $169. Now only $89.

NEW "V" FACE T & G router bit for up to 1-1/8" material. WL-1488 only $30.
2 PC. SET "V" FACE T & G now in 2 sizes for the shaper 3/8" to 5/8" WL-1571 only $99. 3/4" to 1" WL-1572 only $119.

GLUE JOINTS in 2 sizes, for up to 5/8" (also is drawer joint cutter)
1/4" shank WL-1430-1 only $24.
1/2" shank WL-1430-2 only $24.
for up to 1-1/4" material
1/2" shank WL-1430 only $35.

T & G FLOORING CUTTERS
For the Router WL-1488-1 only $39.
For the Shaper WL-1584 only $59.
T&G Router bit For 1/4" to 1/2" material WL-1488-2 only $30.

For the Shaper
Glue Joint WL-1706 only $35.
Lock Mitre WL-1581 only $40.

Router bit CORNER LOCK MITRES in 3 sizes
WL-1420-2 (1/4" shank-up to 5/8" material) only $25.
WL-1420-1 (1/2" shank-1/2" to 3/4" material) only $30.
WL-1420 (for material to 3/4" to 1-1/4") only $38.

NEW Carbide tip ROSETTE CUTTERS cutting width–2-1/4" $39. 3-1/4" $49.

SUPER BUY!!

These great sets are packaged in an attractive wooden box! Available in both 1/4" and 1/2" shank
- 8 pc. Joint Making Set 2 Straight Bits, 6 Dovetails $49.
- 6 pc. Roundover Set 1/8" 3/16" 1/4" 5/16" 3/8" 1/2" radius $55.
- 5 pc. Cove Set 3/16" 1/4" 5/16" 3/8" 1/2" radius $49.

NEW 24 pc. SUPER Set only $129.

SUPER SALE!!

CUTTERS and BEARING SETS (to change depth of cut) Two-Flute Cutters in 1/4" or 1/2" shank. Allen wrench incl.

Priced at only $15. ea. $39. Set of 3

- 5/32" kerf w/3 bearings, cuts slot to fit all biscuit sizes. Sample bag of biscuits incl.
- Rabbeting Bit with 4 bearings for rabbets of 1/4", 5/16", 3/8" & 1/2" depth
- 1/4" kerf Slot Cutter with 4 bearings for cutting slots of 1/4", 5/16", 3/8" & 1/2" depth

Circle No. 1395

1998 Better Homes and Gardens®/
NAHB Remodelors™ Council

Home Improvement Contest

OFFICIAL ENTRY RULES:

1 This contest is open to U.S. residents, 18 years of age or older, except employees and their immediate families of Meredith Corporation, co-sponsors and Home Furnishings Council, and their affiliates, subsidiaries, and advertising agencies. Preliminary entry blank must be postmarked by November 2, 1998 and received by December 1, 1998. Final entry form must be postmarked by February 1, 1999 and received by March 1, 1999. Final entry must include photos of project, written description of objectives, recipes for co-sponsor prizes and floor plans (if applicable). Meredith Corporation not responsible for lost, late, misdirected or illegible entries.

2 You may enter more than one project in the contest, but not the same project in two different categories. Projects may be do-it-yourself and/or those completed by professional contractors/architects/designers. Each project may be entered by only one person. Projects must be completed in 1998.

3 Entries will be judged on appearance, function and cost-effective use of materials. In case of a tie, the entry with the highest score in appearance will be awarded the prize. Judging will be under the direction of Better Homes and Gardens® magazine. Co-sponsor awards are also judged by representatives of the co-sponsor. Decisions of judges are final. All winners except for co-sponsor awards will be chosen on or about June 1, 1999. Co-sponsor winners will be selected by August 1999. Winners will be notified by mail. Winners will be required to sign an Affidavit of Eligibility, Assignment and a Release of Liability within ten days of notification or a new winner may be chosen. Travel companion of Grand Prize winner will be required to sign a release.

4 **PRIZES:** One Grand Prize includes $10,000, plus an all-inclusive, 7-Day Vacation for Two at the Radisson Cable Beach Resort, Nassau, Bahamas and coach airfare from nearest major U.S. airport (some restrictions may apply), 7 nights lodging, all meals/beverages, on-site activities. Accommodations subject to advance notice, space availability and black-out dates. Trip must be taken within one year from date of awarding. Approximate retail value $4,500. Two Runners-up will receive $4,000 each. Eight Class A/Four First Place winners will receive $1,500 each; Eight Class B/Four Second Place winners $750 each; Eight Class C/Four Third Place winners $300 each. 72 Merit winners will receive $100 each.

5 For a list of prize winners (available after August 1, 1999), send a separate self-addressed, stamped envelope to: Better Homes and Gardens®/NAHB Remodelors™ Council Home Improvement Contest Winners' List, P.O. Box 14494, Des Moines, Iowa 50306-3494.

6 Entries and entry materials become the property of Meredith Corporation and will not be returned. By acceptance of prize, winners agree that all rights, including copyright in all entry material, are assigned to Meredith Corporation. Submission of entry constitutes permission to use winner's name, address, likeness and information regarding entrant, his/her family and property by Meredith Corporation and co-sponsors in promotion of the contest, unless prohibited by law. The project submitted cannot have been previously published or photographed by, or committed to publication in any other magazine.

7 Contest is subject to all federal, state and local laws and regulations. All liability for federal, state and other taxes are the sole responsibility of each winner. This contest is void where prohibited by law.

8 Residents of AZ, MD, ND and VT are not eligible to win the co-sponsor and Home Furnishings Council Awards. No prize transfer or substitution.

9 "Why My Home is My Haven" Contest Rules. Only eligible entrants to the Better Homes and Gardens®/NAHB Remodelors™ Council Home Improvement Contest may enter. Type or legibly print a 50-100 word essay describing "Why My Home is My Haven." Place in a separate envelope labeled, "Why My Home is My Haven Contest," and include with Home Improvement Contest entry. The essay submitted must be original and cannot have been previously published. Entries will be judged on originality and clarity of expression. Judging will be under the direction of the Home Furnishings Council. Material will become the property of the Home Furnishings Council. By acceptance of prize, winner agrees that all rights, including copyright, are assigned to Home Furnishings Council. Submission of entry constitutes permission to use winner's name, address, likeness and information regarding entrant, his family and property by HFC, without additional compensation.

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DELTA TOOLS

Model	Description	List	Sale
31-695	6" Belt/9" Disc Sander	441	299
23-710	New Sharpening Center	217	169
23-680	6" Bench Grinder 1/4 HP	80	69
31-460	4" Belt/Disc Sander	198	125
40-560	16" 2 speed Scroll Saw	230	155
40-540	16" var/spd Scroll Saw	249	179
11-990	12" Bench Drill Press	255	184
11-090	32" Radial Bench Drill Press	405	279
43-505	1/2" Bench Router/Shaper	398	289
22-540	12" Bench Top Planer	Sale	329
28-195	10" Band Saw	390	309
22-560	12-1/2" Bench top Planer		395
36-865	Versa Feeder Stock Feeder		249
36-220	10" Compound Mitre Saw	294	199
28-185	Bench Band Saw	213	168

NEW Single Stage Dust Collectors

50-840	1 HP, 650 CFM	270	225
50-850	1-1/2 HP, 1200 CFM	Sale	309
50-851	2 HP, 1500 CFM	Sale	455
37-070	6" w/spd Bench Jointer	351	265
14-650	Hollow Chisel Mortiser	380	239
33-990	10" Radial Arm Saw	981	799
36-905	30" Undercut	346	245
36-906	50" Undercut	444	325
17-900	16-1/2" Floor Drill Press	490	399
37-190	6" Deluxe Jointer	603	445
36-285	8-1/4" Builders Saw w/ stand	Sale	268
36-210	10" Compound Mitre Saw	344	219
34-555	Sliding Table	487	289
36-250	10" Slide Compound Saw	825	489
31-780	Oscillating Spindle Sander	253	194
46-700	12" Wood Lathe	575	465
34-444	10" Contractors Table Saw	Sale	615
34-445Z	10" Table Saw w/ 30" fence, cast iron wing, 34-914 table board, & 35-032 blade	Sale	839
28-275	14" Band Saw 3/4 HP	Sale	595
28-280Z	14" Bans Saw 1 HP w/ 50-274 mobile base, 28-843 rip fence, & 28-266 cool blocks	Sale	839
40-650	Q3 16" Scroll Saw	Sale	479
22-675	DC380 15" Planer	Sale	1175
31-280	Sanding Center w/ stand	Sale	799

MILWAUKEE TOOLS

6527	NEW Sawzall with case	343	169
6537-2	6527 w/quick lok blade change	224	175
0407-22	12V Drill w/kyls chuck&2 batt	380	175
0224-1	3/8" Drill 4.5 amp magnum	236	132
0234-1	1/2" Drill 4.5A mag 0-850 rpm	255	129
0235-1	1/2" Drill w/keyless chuck	255	142
0244-1	1/2" Drill 4.5A mag 0-600 rpm	255	129
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	213	119
0228-1	3/8" Drill 3.5 amp 0-1000 rpm	207	109
0375-1	3/8" close quarter Drill	255	148
0379-1	1/2" close quarter Drill	288	165
6546-1	cdls Screwdvr 200 & 400 rpm	150	89
6547-1	6546-1 w/bits,1/4" chuck & cs	195	108
5399	1/2" D-hdle Hammer Drill Kit	356	219
5397-1	3.8" w/ spd Hammer Drill Kit	275	145
5371-1	1/2" w/ spd Hammer Drill Kit	360	194
3107-1	1/2" w/spd right angle Drill Kit	411	234
3300-1	1/2" w/ spd right angle Drill	378	219
6142	4-1/2" Grinder w/case & acc.	224	129
6490	10" Mitre Saw	496	265
6491	6490 w/ carbide blade & bag	594	328
6494	10" Compound Mitre Saw	585	315
6266-6	Top Handle Jig Saw	315	159
6496	10" Slide Compound Saw	1050	569

FREUD CARBIDE TIPPED SAW BLADES
5/8" Bore - Industrial Grade

Item	Description	Teeth	List	Sale
LU72M010	Gen Pur. A.T.B.	10° 40	69	42
LU82M010	Cut-off 10"	60	93	44
LU94M011	Comb 10"	50	78	45
LU85M010	Super Cut-off	10° 80	115	59
LM72M010	Ripping 10"	24	69	38
LU73M010	Cut off 10"	60	84	49
LU87M010	Thin Kerf 10"	24	72	45
LU88M010	Thin Kerf 10"	60	88	49
LU98M010	Ultimate 10"	80	128	68
LU91M010	Compnd Mitre 10"	60	88	54
F410	Quiet Blade 10"	40	95	49
TK303	7-1/4" Finishing	40	38	25
SD308	8" Dado - Carbide		230	119
SD508	8" carbide w/case & shims		344	168
FB100	16 piece Forstner Bit Set		338	194
94-100	5 pc. Router Bit Door System		320	159
FT2000E	Plunge Router		Sale	205
FJ85	Top Hdl Jig Saw		Sale	99
JS102	Biscuit Jointer		Sale	125
TR21S	8-1/4" Mitre Saw		Sale	249

HITACHI TOOLS

C8FB2	8-1/2" Slide Compound Saw	1169	469
C10FS	10" Slide Compound Saw	1627	739
C15FB	15" Mitre Saw	1346	659
NV45AB	Coil Roofing Nailer	935	379
NT65AA	15 ga. Brad Nailer 1-1/4 - 2-1/2"	636	345
C10RA	NEW 10" Table Saw	632	319

WAP VACUUMS

Model	Description	List	Sale
766RDF	10 gallon turbo vacuum	845	465
766RDF-D	"Drywaller" 10 gal turbo vacuum	915	549
766RDF-DAS	Above vac w/ auto start	950	589

MAKITA TOOLS

Model	Description	List	Sale
5090DW	3-3/8" Saw Kit 9.6 volt	280	155
DA391D	3/8 angle Drill 9.6V	166	114
DA391DW	3/8" angle Drill Kit 9.6V	341	189
ML900	Incandescent Flashlight 9.6V.	14.95	
6095DWE	9.6 volt Drill Kit w/2 batt	Sale	125
6095DWLE2	6095DWE w/flashlight	Sale	139
6095D	6086DW Drill only & case	Special	65
632007-4	9.6 volt Battery	47	30
632002-4	7.2 volt Battery	39	28
6203DWAE	9.6V 3/8" Drill Kit w/2 batt	361	159
6211DWHE	12V 3/8" Drill Kit w/2 batt	368	175
6311DWHE	12V 1/2" Drill Kit w/2 batt	399	205

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6213DWAE	12V 3/8" Drill Kit	325	169
6233DWAE	14.4V 3/8" Drill Kit	358	199

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6073DW 7.2V cdls Drill Kit. Variable speed & clutch. Complete with battery, charger, & case. **Super Sale 99**

9900B	3"x21" Belt Sander w/bag	347	179
9924DB	3"x24" Belt Sander w/bag	360	189
4301BV	Orb. var. spd Jig Saw 3.5A	292	155
JR3000V	v/ spd Recip Saw w/case	264	135
N1900B	3-1/4" Planer with case	263	142
1912B	4-3/8" Planer	352	199
N9514B	4" Disc Grinder 4.6 amp	118	65
DA3000R	3/8" Angle Drill	355	185
2708W	8-1/4" Table Saw	637	295
6405	3/8" Drill Rev. 0-2100 rpm	115	65
6510LVR	3/8" Drill Rev. 0-1050 rpm	188	98
6013BR	1/2" Drill Rev. 6 amp	270	154
9401	4" x 24" Belt Sander w/bag	458	235
5007NBK	7-1/4" Circ Saw w/ case	250	125
LS1011	10" Slide Compound Saw	995	429
LS1211	12" Slide Compound Saw	1620	779
3901	Plate Joiner Kit	376	209
3612C	3 HP Plunge Router	492	269
LS1040	10" Crmpd Miter Saw	460	259
LS1013	10" Dual Compound Slide Miter Saw	1088	599
BO5010	5" Random Orbit Sander with dust pickup	142	72
LS1220	NEW 12" Compound Miter Saw	379	

SENCO AIR NAILERS

SFN1+	Finishing Nailer 1" - 2" w/ co	448	299
SN325	Nailer 1-7/8" - 3-1/4"	665	365
SLP20	Pinner w/cs 5/8 -1-5/8"	422	229
SKS	Stapler 5/8" - 1-1/2"	390	279
SN70	Framing -Clip Hd 2"-3-1/2"	725	449
SN65	Framing -Full Hd 2"-3-1/2"	709	389
SFN40	Finish Nailer 1-1/4 - 2-1/2"	569	349

BOSTITCH AIR NAILERS

Model	Description	List	Sale
N80S-1	Stick Nailer	Super Sale	339
N80C-1	Coil Nailer	Sale	339
RN45	Coil Roof Nailer 3/4 - 1-3/4	845	369
N60FN-2K	Finishing Nailer w/ case	557	275
BT35-2K	Brad Tacker 5/8" - 1-3/8" with case, oil, & brads	279	125
CWC100	1 HP Pancake Compressor	440	305
MIIIFS	Flooring Stapler 15 gauge	902	529
S32SX-1K	Finish Stapler-1/2" - 1-3/8" with case & oil	269	145

SKIL TOOLS

77	7-1/4" Worm Drive Saw	Sale	158
77M	77 Mag Worm Saw	Sale	168

PANASONIC CORDLESS

EY6100FQKW	12V Drill kit w/ 2 Ironman batteries, 15 min. charger, & case	379	179
EY6230FQKW	NEW 15.6V Drill Kit with 2 Ironman batteries, 30 minute charger & case	425	215
	Batteries for above are NEW 2.0 amp-hr		
EY6181CRKW	9.6V Drill Kit w/ 2 batteries, 1 hour charger, & case	307	169
EY3503FQWKW	NEW 5-3/8" 12V Wood Cutting Saw Kit	500	259

PASLODE IMPULSE GUNS

Model	Description	List	Sale
IM250	Trimpulse Finish Nailer Kit	1130	548
IM325	Impulse Framing Nailer Kit	1130	548
CT325SS	Cdls Framing Nailer Kit	1120	399

RECORD WOODWORKING VISES

Model	Jaw Width	Opening	List	Sale
53E	10-1/2"/15"	Quick release	248	125
52D	7"/8"	Quick release with dog	169	95
52-1/2D	9"1/3"	Quick release with dog	231	99

SIOUX TOOLS

8030	3/8" var/spd Drill	263	165
8000	3/8" var/spd close qtr Drill	211	135
690	5" Air Random Orbit Sander	228	138

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DEWALT TOOLS

Model	Description	List	Sale
DW321K	Top Handle Jigsaw Kit	300	164
DW364	7-1/4" Circ. Saw w/brake	294	162
DW610	1-1/2 HP 2 handle Router	266	152
DW411	1/4 sheet Palm Sander	88	58
DW682K	Biscuit Joiner with case	448	199
DW705	12" Compound Mitre Saw	734	359
DW625	3 HP v/ spd PlungeRouter. **DW625 router comes with DW6913 edge guide !**	Sale	279
DW621	NEW 2 HP Plunge Router. **DW621 comes with Free DW6956 fine height adjuster**	400	218
DW675K	3-1/8" Planer with case	292	164
DW431	3 x 21 v/spd Belt Sander	338	188
DW421	5" Palm Ran. Orb Sander	144	74
DW673K	Laminate Trimmer Kit	364	188
DW274	Drywall Gun, 0-4000, 6.3 amp	160	95
DW935K	14.4V 5-3/8" Trim Saw Kit	444	237

DEWALT CORDLESS DRILLS

DW952K-2	3/8" v/spd w/ two 9.6V XR batteries	284	129
DW972K-2	3/8" v/spd w/ two 12V batt	362	182
DW904	12 volt flashlight	48	29.95
DW991K-2	3/8"variable speed w/ two 14.4V XR batteries	415	209
DW994KQ	1/2" variable speed w/ one 14.4V XR batteries. **Above drill kits come w/ charger & steel case!**	458	239
DW991KS-2	DW991K drill, DW935 trim saw, & case	Sale	345

DEWALT 18 VOLT CORDLESS TOOLS

DW938K	NEW Recipro Saw Kit	520	269
DW995K	1/2" Drill Kit	428	229
DW997K	1/2" Drill/Hammer Drill Kit	454	249
DW936K	5-3/8" Saw Kit	458	249
DW995KS-2	DW995K Drill, DW936 Saw and case	Sale	385
DW991KC-2	DW991K 14.4V drill kit, DW937 14.4V recipro saw,& case	349	
DW995KC-2	DW995K 18V drill kit, DW938 18V recipro saw, & case	395	
DW997KC-2	DW997K 18V drill kit, DW938 18V recipro saw, & case	405	

DEWALT BENCH TOP TOOLS

DW708	12" Dual Compound Slide Mitre Saw	Sale	679
DW788	20" Scroll Saw	Sale	489
DW733	12" Planer	Sale	449

JORGENSEN ADJUSTABLE HANDSCREWS

Item#	Jaw Length	Opening Capacity	List	Sale	Box of 6
#0	6"	4-1/2"	20.35	12.10	66.95
#1	10"	6"	23.30	12.90	71.95
#2	12"	8-1/2"	26.75	14.90	83.95
#3	14"	10"	33.85	18.55	105.75
#4	16"	12"	44.05	24.65	140.95

BIESEMEYER FENCES

B-50	50" Commer. Saw	443	325
T-SQUARE 52	52" Homeshop	360	279
T-SQUARE 40	40" Homeshop	335	255
T-SQUARE 28	28" Homeshop	325	245

PONY CLAMP FIXTURES

Model	Description	List	Sale	Lots of 12
50	3/4" Black Pipe	15.45	8.50	92.50
52	1/2" Black Pipe	12.65	6.95	74.95

BOSCH

Model	Description	List	Sale
1587VS	Top Handle "CLIC" Jig Saw	293	139
1587AVSC	1587VS 50th Anniversary saw with case	Sale	149
1584VS	Barrel "CLIC" Jig Saw	288	139
	Bosch Metal Case for above Jig Saws	24	
	Bosch 30 blade assortment for Jig Saws	28.99	
	1584VS or 1587VS with steel case and 30 Bosch blades	Sale	175
1295DH	5" Random Orb Palm Sndr	145	89
1274DVS	3"x21" v/spd Belt Sander	301	175
1276D	4"x24" Belt Sander	379	219
1276VSK	NEW 1-1/2"x12" Belt Sander	218	129
1275DVS	3"x24" v/s Belt Sndr	379	214
1276DVS	4"x24" v/s Belt Sndr	408	229
1347AK	4-1/2" Grinder w/cs & acc.	172	89
1194VSR	1/2" v/ spd Hammer Drill	272	155
1194VSRK	above Drill w/ case	303	169
1604A	1-3/4 HP 2 Handle Router	269	142
1613EVS	2HP v/s Plunge Router	369	199
1615EVS	3 HP v/s Plunge Router	536	305
1634VSK	Recip Saw 10.5 amp	335	189
3315K	12V T-handle Drill Kit	345	159
3615K	14.4V Drill Kit	354	174
3107DVS	5" Random Orbit Sander	165	98
3107DVSK	3107DVS with case	195	115
3725DVS	5" Random Orbit Sander	256	149
3727DVS	6" Random Orbit Sander	266	154
B3915	10" Slide Compound Saw	1050	559
11224VSR	7/8" SDS Rotary Drill	404	229

STABILA LEVELS

21990	NEW 10" Torpedo Level	Sale	13.95
24640	24" Level w/ hand holes	62.20	43
24670	48" Level w/ hand holes	79.70	55
24610	48" Level w/ angle setter vial	80	55
	24610 level comes w/ Free 21090 Torpedo level !		

PORTA NAILER

401	Porta Nailer complete	295	209
501	Face Nailer complete	295	209

DAVID WHITE

LP6-20	Sight Level package - 20x	329	215
LP6-20XL	LP6-20 w/9056 tripod & 7620 rod		269
LT8-300	Level Transit - 26x	739	489
LT8-300P	above Level w/ optical plum	869	575
LT6-900	Level Transit - 20x	419	279
ALT6-900	Auto Level - Transit -18x	666	439
ALTP6-900	above Level with tripod & rod	799	509
AL8-22S	Automatic Level - 22x	583	295
AL8-26S	Automatic Level - 26x	854	325

JET TOOLS

JJ50S	6" Jointer - open stand	Sale	429
JJ6CSX	6" Jointer - closed stand	Sale	489
JJ8CS	8" Jointer - closed stand	Sale	1189
JWP124P	12" Benchtop Planer	Sale	369
JWBS14OS	14" Band Saw 3/4 HP - open stand	Sale	499
JWBS14CS	14" Band Saw 1 HP - closed stand	Sale	579
JWTS10JF	10" Contractor Table Saw with 30" Jet fence 1-1/2 HP	Sale	599
JWTS10CWPF	10" Contractor Table Saw with 30" Exacta fence 1-1/2 HP	Sale	749
JTAS10XS01	10" Tilting Arbor Table Saw with 50" Exacta fence - 3 HP	Sale	1399
JDP17MF	16-1/2" Drill Press 3/4 HP - 16 speed	Sale	429

PORTER CABLE

9444	Profile Sander Kit	220	99
9444VS	Var/spd Profile Sander Kit	207	115
690	1-1/2 HP Router 8 amp	279	149
6931	Plunge Router Base	139	82
693PK	690 and 6931 plus case	Sale	199
691	1-1/2 HP Router D-handle	303	164
693	1-1/2 HP Plunge Router Base	338	184
697	1-1/2 HP Router/Shaper	418	235
698	Heavy Duty Shaper Table	238	135
352VS	3x21 v/s Belt Sander w/bag	321	175
360	3"x24" Belt Sander w/ bag	397	214
360VS	360 Sander w/ variable speed	429	229
362	4"x24" Belt Sander w/ bag	412	224
362VS	362 Sander w/ variable speed	446	239
9125	3-1/4" Planer Kit w/ case	250	145
9118	Porta Plane Kit 7 amp	400	235
505	1/2 sheet Pad Sander	249	139
97549	Top handle Jig Saw 4.8 amp w/ case & blades	275	144
330	Speed Block Sander 1/4 sheet	120	68
556	Biscuit joiner w/5556 fence . Sale		135
557	NEW Plate Jointer with tilt fence. Includes 2" & 4" blades for use with standard & face frame plates	400	215
345	6" Saw Boss 9 amp	207	118
9647	TIGER CUB Recip. Saw	230	134
9637	Full var/spd Recip Saw 8 amp	276	148
7519	3-1/4 HP Router 2 Handle	469	258
7518	3-1/4 HP 5 speed Router	534	289
7539	3-1/4HP v/spd Plunge Router	534	289
7310	5.6 amp Laminate Trimmer	176	102
97310	Laminate Trimmer Kit comp	336	189
7335	5" Random Orbit Sander	254	139
97353	7335 w/ case & dust pick up	274	149
7336	6" Random Orbit Sander	259	145
97366	7336 w/ case & dust pick up	284	159
332	Palm Grip Rndm Orb Sander	133	59
333	above sander with dust bag	148	65
333VS	NEW Random Orbit Sander - variable speed	150	79
334	333 Sander with PSA pad	148	65
335	NEW Palmgrip Random Orbit Sander with dual flip pad	Sale	85
310	Production Lam. Trimmer	270	154
347K	7-1/4" "Framers" Circ Saw with plastic case	250	129
743K	7-1/4" "Framers" Circ Saw with case - left hand version	250	129
9737	Tiger Recipro Saw	307	158

New Porter Cable Cordless Nailers !

CDA250	Angle Finish Nailer 1-1/4" to 2-1/2"	500	279
CFN250	Finish Nailer 1" to 2-1/2"	500	279
CMS200	Medium Crown Stapler 1" to 2"	500	279

Porter Cable Pneumatic Nailers

BN125	Brad Nailer -18 ga. 5/8" - 1-1/4"	144	89
BN200	Brad Nailer -18 ga. 3/4" - 2"	238	139
FN250A	Finish Nailer -16 ga. 1"-2-1/2"	362	189
DA250A	Nailer -15 ga. 1-1/4"-1-1/2"	412	235
FC350	Framing Nailer - clipped head	558	289
FR350	Framing Nailer - round head	550	289
RN175	NEW Roofing Coil Nailer	504	289

Porter Cable Compressors

CF1400	1 HP, 4 gal. Pancake	Sale	195
CF1540	1-1/2 HP, 4 gallon Side Stack	Sale	295
CF2400	2 HP, 4 gal. Side Stack	Sale	319

Porter Cable Cordless Drills

9862	12V Drill Kit w/ 2 batteries	382	169
9862F	9862 Drill Kit with flashlight	Sale	189
9863	12V Drill Kit - pistol grip	319	179
9872	14.4V Drill Kit w/ 2 batteries	424	205

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FREE FREIGHT TO THE CONTINENTAL STATES ON EVERY ITEM • GIFT CERTIFICATES NOW AVAILABLE

When snipe is a good thing

When the tool testers at *WOOD*® magazine rate planers, much evidence of snipe—the slightly deeper knife cut at the front and back end of the board—lowers the score. If you worked as a logger in the woods, though, snipe would be a good thing.

Beveling around one end of a log with a chainsaw or ax makes it easier to pull or skid over the ground. Loggers call a log with such a helpful bevel a sniped log.

The Spruce Goose finds a new home

From the day of its flight until Howard Hughes' death in 1976, the *Spruce Goose* sat in its Culver City, California, hangar. Then it had a number of owners, including the Smithsonian Institution, before it was finally leased by the Walt Disney Company in 1988 from the Aero Club of Southern California/Aero Exhibits, Inc (AEI). It joined the famed ocean liner Queen Mary at Long Beach as a major tourist attraction. But by 1990, the Walt Disney company determined that the *Spruce Goose* wasn't a moneymaker and terminated the lease with its owner. The HK-1 had been evicted.

From the dozens of bids AEI received over a two-year span, the best site was determined to be the future Evergreen AirVenture Museum in McMinnville, Oregon. So in the fall of 1992, the giant aircraft was disassembled, shrink-wrapped in plastic, and moved by land and sea to its new nest 40 miles from Portland. The *Spruce Goose* is presently housed in a clear plastic structure awaiting its permanent shelter

The exhibit of the *Spruce Goose* and its WWII-era companions is named the Captain Michael King Smith Evergreen Aviation Educational Center. Fund-raising activities to build the new center include sales of *Spruce Goose* souvenir merchandise, photographs, and a certificate bearing an actual piece of fabric from the aircraft's deteriorated control surfaces.

For more information, write: Evergreen AirVenture Museum, 3850 Three Mile Lane, McMinnville, OR 97128. Call 503/472-9361. Or visit Evergreen's website at http://www.sprucegoose.org

Above. **The disassembled and shrink-wrapped *Spruce Goose* arrives in McMinnville, Oregon, after an ocean voyage by barge from Long Beach to Portland.** ***Left.*** **The original of this souvenir aircraft data plate was only recently discovered on the HK-1.**

Illustrations: Jim Stevenson

Aspen by another color

Michigan and other lake states have an abundance of aspen (*Populus grandidentata* and *tremuloides*). It naturally generates after logging of other species.

Normally, the whitish, lackluster hardwood ends up as construction lumber, paper pulp, crates, boxes, particleboard, and matches. All that may be changing, though.

Genetic engineers at Michigan Technological University, in Houghton, Michigan, have found a way to tamper with the species' genes so that the wood becomes an attractive reddish color. The purpose of head researcher Chung-Jui Tsai's experiment was to alter the lignin of the tree in order to make it easier to turn into paper pulp. However, when the bark was peeled from the experimental trees, the wood displayed a rosy, salmon hue. The distinctive color may upgrade aspen's commercial importance sometime in the future. Its new beauty makes the wood appealing for use as furniture, exposed beams, and paneling.

Where the hardwood goes

Estimates by the U.S. Forest Service put the amount of merchantable hardwood (trees over 12" in diameter) in the United States at 700 million board feet. And, they say, our hardwood resource each year grows more than twice the amount being harvested.

Of the 12 million board feet of sawtimber (not including pulpwood for papermaking) cut annually, slightly over half is for low-grade industrial uses, such as timbers and pallets. About 10 percent of the hardwood is exported. The majority of the rest goes to the furniture industry.

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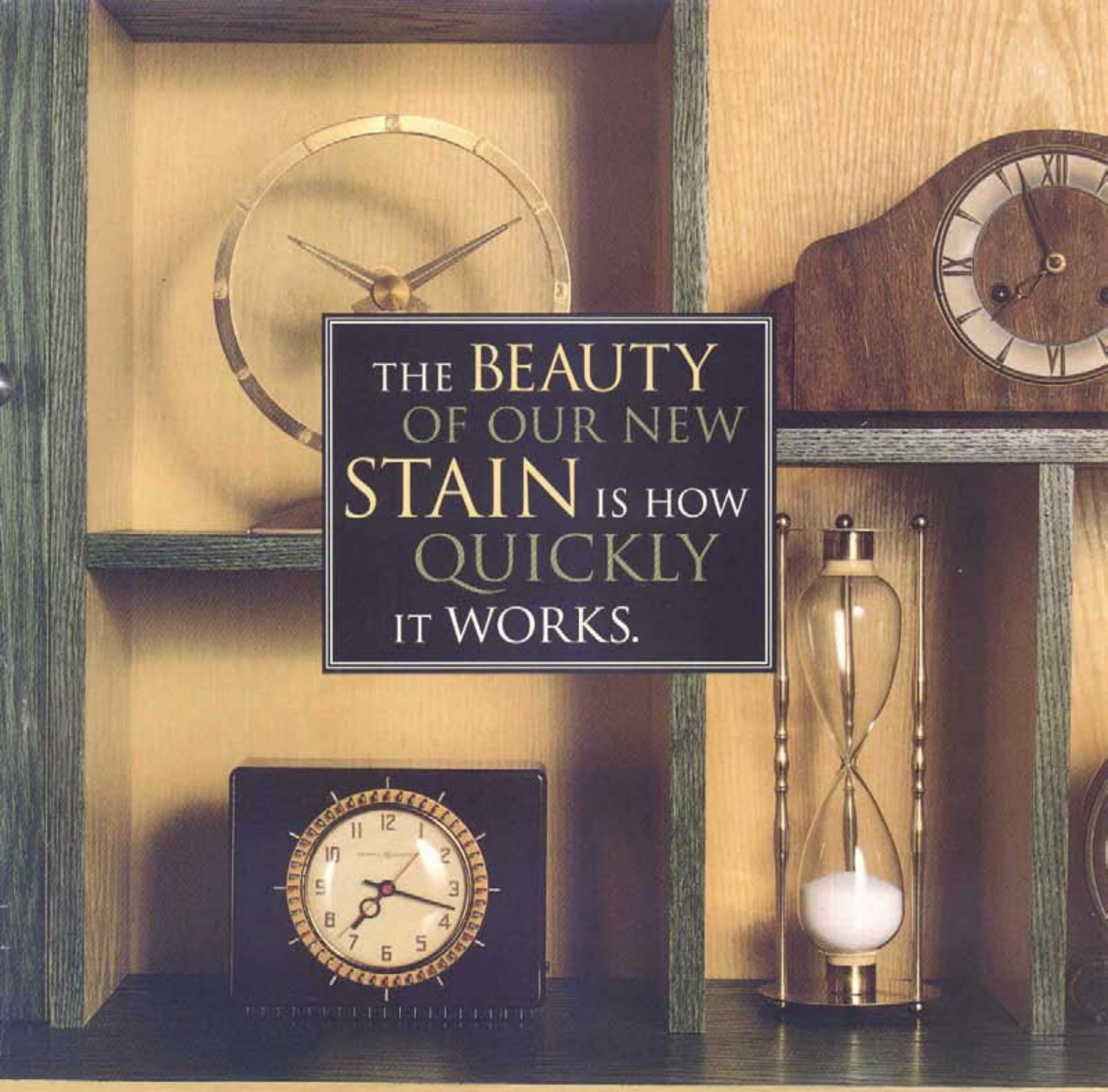

Now your Sherwin-Williams store has a line of interior wood stain that not only dries quickly, but also comes in over 40 beautiful colors, including eight fun colors. New WoodClassics™ dries so quickly, you can complete a staining project in hours instead of days. Discover the beauty of WoodClassics in your home. Call 1-800-4-SHERWIN (1-800-474-3794) for a store near you.

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CFN250 Cordless Finish Nailer
16 Ga., 3/4" - 2 1/2"

CMS200 Cordless Medium-Crown Stapler
16 Ga., 7/16"crown 1" - 2"

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The amazing oil-free piston and cylinder design keep carbon deposits to a minimum, delivering shot after shot without the need for maintenance and downtime. Plus there's no messy oil to spoil finish work.

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Piezo ignition eliminates batteries and complicated electronics. You generate the spark when you pull the trigger for consistent, trouble-free and uniform firing. Manual recycling means more reliable operation and lower costs.

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